

Adaptation of circular models for global heritage cities

Citation for published version (APA):

Ikiz Kaya, D. (2019). Adaptation of circular models for global heritage cities: regeneration of Istanbul world heritage site as a case study. In *EAA 2019: beyond paradigms: abstract book* (pp. 101-102). European Association of Archaeologists.

Document status and date:

Published: 01/01/2019

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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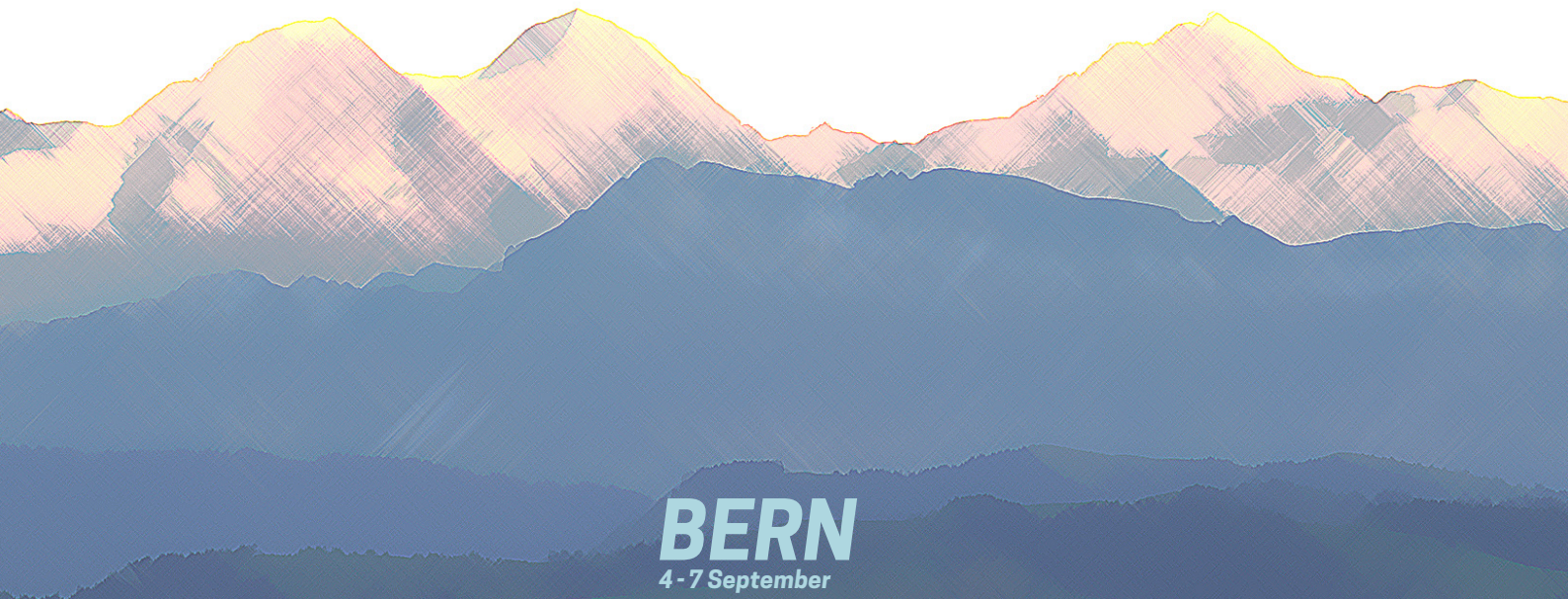
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25th EAA Annual Meeting (Bern, 2019) – Abstract Book

Technical editing: Kateřina Kleinová (EAA)

Design and layout: Susanna Kaufmann

ISBN: 978-80-907270-6-9

European Association of Archaeologists

Bern, August 2019

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Theme: Archaeology of mountainous landscapes

Organisers: Citter, Carlo (Siena University) - Tys, Dries (Vrije Universiteit Brussel)

Format: MERC Forum

Material culture depends on humans and humans depend on material culture. The entanglement between humans and things has for a long time been part of the archaeological agenda, also in medieval and post-medieval archaeology. However, the relation of material culture and people that live in marginal areas has hitherto received little attention. In the MERC Forum we invite medieval and post-medieval archaeologists to discuss with our Forum keynote speakers how material culture was part of the lives of people living in high altitudes (mountainous landscapes such as the Alps, the Scottish Highlands or the Pyrenees) and in high latitudes (roughly above c. 60° degree of latitude). Did people that live in such marginal areas have access to the same amount and quality of material culture necessary for survival than people living in cities and densely settled areas? What artefacts were considered essential for daily life, and did artefacts, which in other contexts would be considered luxury goods, enter these marginal areas too? How difficult was access to material culture and what sorts of material culture did they abstain from?

ABSTRACTS

1 THE MATERIALITY OF PASTORAL STRATEGIES IN THE ALPS: AN ETHNOARCHAEOLOGICAL PERSPECTIVE

Author(s): Carrer, Francesco (Newcastle University)

Presentation Format: Oral

Pastoralism and transhumance are pre-industrial rural practices based on the exploitation of extreme environments for livestock grazing, in areas that are considered marginal for arable farming. Pastoral practices characterise different mountain regions (where the vertical gradient generates the proximity of different ecosystems) and are particularly relevant in the socio-economic history of the Alps. It is widely acknowledged that material culture plays an important role in the adaptation of pastoral groups to mountain landscapes. Accessibility, particularly challenging in montane areas, constrains settlement choices and the amount of artefacts that pastoralists carry with them. Resource availability leads to the use of specific types of raw material. And extreme weather conditions have a critical influence on rural architecture. Therefore, in order to understand human-environment interaction at high altitude, a more accurate understanding of the material culture of pastoral groups is necessary. Ethnoarchaeology provides an ideal perspective to interpret the complex meanings of artefacts and architectures produced and used by livestock farmers in the Alpine uplands. Building on the results of an ethnoarchaeological project recently carried out in the Western Italian Alps (EthWAL project), this paper will analyse the materiality of pastoralism in the Alps, with specific attention on adaptive, socio-economic and cultural values of the contexts and objects investigated. This, in turn, will shed new light on the potential and challenges of archaeological assemblages in mountain contexts for the analysis of ancient pastoral activities.

2 BASQUE HIGH MATTERS. MATERIALIZATION PROCESSES IN BASQUE HILLS AND BOREAL AREAS

Author(s): Escribano-Ruiz, Sergio (University of the Basque Country)

Presentation Format: Oral

The Basque Country is considered a mountainous area, with jagged hills scattered along an east-west axis ending in the Pyrenees. This orography has been the scenario where the Basques did settle and where uncountable materialization processes occurred. In addition Basques are known for their Modern Age fisheries in a subpolar area as the Gulf of St Lawrence. In this presentation we will consider how material culture was created and used by Basques and how they depended on materiality to face their changing life conditions both in the hills of their homeland and in that specific colonial environment. On the one hand, the focus will be upon a specific type of rural building that is characteristic of Basque hills settlement, and that could not be understood without accounting for globalization. On the other hand, the material culture associated to Basques in Canada will be compared to that used in their homeland, to see if the changing climatic conditions implied a different set of materials. One resulting conclusion might be that even apparently marginal, those hills and subpolar areas were in the epicentre of a progressive globalism and capitalism in which Europe was immersed.

3 GLOBAL DEEDS AND LOCAL NEEDS. MARKETS AND MATERIAL CULTURE IN THE NORTH ATLANTIC

Author(s): Lucas, Gavin (University of Iceland)

Presentation Format: Oral

European settlements in the mid North Atlantic – Iceland, the Faroes and Greenland – had more or less continuous contact with mainland Europe to the southeast during the thousand years since Norse settlers had spread to these islands. Fish and wool among other goods were traded for flour and grain, clothing and other luxury items, the exact composition of trade varying over time. In this paper, I will explore the relationship between domestic and foreign trade markets between the 17th and 19th centuries as they developed out of the earlier, medieval context, focusing mainly on Iceland. This was a period in which new modes of consumption and luxury goods stimulated by new global markets and networks, were re-shaping mainland Europe. How did an island like Iceland respond to these changes – a county with no urban centres and only informal domestic markets until the 19th

17 MEDIEVAL ARCHAEOLOGY IN EUROPE TODAY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Tys, Dries (Vrije Universiteit Brussel) - Citter, Carlo (Siena University)

Format: Round table

The position of Medieval Archaeology at university archaeology departments in Europe is currently not as flourishing as it used to be 20 years ago. After a rise during the 80's and mainly the 90's, when medieval archaeology became a full-fledged subdiscipline of archaeology with everything this entails in terms of approaches, finalities, questions, methods, and developments, the situation has deteriorated. In this round table we want to show the results of a small questionnaire about the situation of medieval archaeology in Europe and North America. The situation is different from country to country. On the one hand the situation of medieval archaeology is still strong in UK, Scandinavia, the Low Countries, but it has weakened a lot in important countries such as Germany, France and Spain. On the other hand, Medieval Archaeology seems to be on the rise in eastern Europe. We want to discuss these results with colleagues from all over Europe, discuss the causes of the difficulties, opportunities, projects and more. We will enlighten you about the 'medieval manifesto' which is an initiative of MERC to define medieval archaeology in the 21st century.

27 ARCHAEOLOGICAL PERSPECTIVES ON REFORM AND REVOLUTION: MATERIAL CULTURE IN THE LONG ELEVENTH CENTURY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Lewis, Michael (British Museum) - Deckers, Pieterjan (Vrije Universiteit Brussel) - McClain, Aleksandra (University of York)

Format: Regular session

Across much of Europe, the eleventh century was a period of significant cultural, political and economic change. This period of transition is reflected in the historic landscape, material culture, architecture, and written evidence, as well as in the regulation and organization of society. While the implications of this period have sometimes been considered within the context of contemporary nation states, we have rarely taken the opportunity to examine this transition across Europe as a whole, highlighting the similarities, discontinuities, variabilities, and scales of change in different locales, countries, or regions.

This session will take a multidisciplinary approach to exploring material culture in its broadest sense and its social implications in the long eleventh century, covering the period AD 950-1150. Papers might consider, for example: how land use and settlement developed over the period, either in urban or rural settings; how political, social and religious variables impacted upon the material environment of people in multiple strata of society; how material culture and related practices changed (or did not); and how these processes of transformation unfolded in relation to other archaeological and written evidence in the period.

The aim of the session is to set the transformations of the eleventh century within a wider chronological and geographical context, in order that this might better inform more localised studies of the material culture of the period.

ABSTRACTS

1 THE SOURCES OF INFLUENCE FOR ROMANESQUE FINDS

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

Presentation Format: Oral

Romanesque metal small finds are rare discoveries in England and Wales. For example, less than 300 items are recorded on the Portable Antiquities Scheme (PAS) database using the style description 'Romanesque', and likewise less than 8,000 items date to c.1050-c.1200, of which over half are coins. The stylistic traits of these items are also considerably varied, raising the question what actually makes them Romanesque – it is just their style, or also their form and function?

This paper will consider typical types of Romanesque metal small finds found/excavated in recent years, but also examine their sources of influence – particularly by exploring motifs in manuscript art. It will question how grounded is the style of these finds in Romanesque art, and ask whether these attributes be connected elsewhere? In short this paper will explore where the art on Romanesque metal small finds sits within the long eleventh century – and beyond...

2 GLASS AND AMBER ARTIFACTS AS AN INDICATOR OF LOCAL AND GLOBAL CHANGES. CASE STUDY OF BOHEMIA BETWEEN 950–1100

Author(s): Tomková, Katerina (Institute of Archaeology of the Czech Academy of Sciences)

Presentation Format: Oral

This presentation of changes in the occurrence of glass and amber adornments in Bohemia in the period between 950–1100 forms the basis for searching for their causes. Imported glass beads, particularly of Eastern origin, and Baltic amber beads were an important part of the fashion and material culture between 950–1000 in Bohemia ruled by Přemyslid dukes, who were con-

nected with the Ottonian Empire, the Piasts in Poland and the Arpáds in Hungary. The involvement of Bohemia in long-distance trade and the presence of an important market in Prague were described by Ibrahim ibn Yaqub in the 960's. Although there was no shift in the geo-political orientation of Přemyslid dukes in the 11th century and there was likewise no significant change of metal jewelry, the glass and amber adornments changed markedly. A substantial decrease in the number of beads can be linked to a local transformation of burial customs and absence of necklaces in graves probably influenced by the Christianization process after the year 1000. The decline of segmented and amber beads, together with an increased occurrence of rings and infrequent other types of beads in hillforts and settlements, may reflect a change in fashion at the local or supra-regional level. They can also indirectly indicate a shift in economy, for example in the routes of long distance exchange. In the 11th century, a boom of adornments made from lead glass, both the high-lead ones, and the ternary ones containing wood-ash alkali is recorded, while soda-lime glass typical of the 10th century became less frequent. Shift in the proportion of artifacts from glass of different chemical composition can also be considered to reflect a global economic change.

3 PLACING HORSE OWNERSHIP AND USE IN 11TH-CENTURY EUROPE

Author(s): Webley, Robert (University of York) - Deckers, Pieterjan (Aarhus University; Vrije Universiteit Brussel)

Presentation Format: Oral

Over the last thirty years we have developed an increasingly heightened sense of the ownership and use of horses in the long 11th century. The main evidence base which has contributed to this new knowledge is an archaeological one, with an influx of new material at our disposal over the same period. The majority of the new material constitutes non-ferrous metalwork discovered through metal-detecting in rural areas, and as such previously underrepresented through conventional archaeological investigation.

This paper aims to provide an up-to-date synthesis of the evidence for equestrianism in the long 11th-century, taking an international approach. Since metal-detected evidence can only play a part when it has been recorded by responsible finders there will be a natural focus on areas where recording schemes for metal-detected finds have been in operation: England, the Low Countries and Denmark. Having explored the various supra-national connections and differences between the surviving components of equestrian equipment, we will attempt to assess the relative social standing of equestrianism in our North Sea case study areas. It is hoped that by taking a wide view of horse ownership and use in the 11th century that a more nuanced sense of its political and social function can be provided for a given country or region.

4 VIKING-AGE CROSS-PENDANTS IN NORTH-EASTERN RUS': NEW ASPECTS ON PRODUCTION AND CIRCULATION OF CHRISTIAN METALWORK AT THE PERIPHERY OF CONVERTED EUROPE

Author(s): Zaytseva, Irina - Makarov, Nikolay (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The purpose of the paper is to discuss the objects of Christian metalwork, which were recently discovered on the sites of Suzdal region, near the boundaries of the Christian world of the late Viking period, and to make comments on their production, circulation, cultural and religious meaning. Research is focused on one of one group of these objects: equilateral crosses with widening branches with three balls (disks) at the ends, the so-called crosses of "Scandinavian type".

The paper presents results of complex examination of 17 cross-pendants with the insight into their morphology, manufacturing techniques and metal composition. Distribution of the finds proves, that such crosses were introduced to Susdal region at the end of X-XI centuries, initially at the "large dwelling sites". The development of these settlements is associated with a special economic system (weight economy) and a special culture, well-known from the excavations of early urban settlements.

Large crosses from Suzdal represent the established iconographic type, but are attributed as the products of local craft. They were cast from high-tin bronze. It has a silvery color, simulating the expensive silver objects. From the fine work of silver crosses, which they imitate, they are distinguished by a high relief and the presence of hemispheres at the ends of branches.

Small crosses, which have a high degree of standardization, were made of multicomponent alloy, one of the most common alloys in Northern Rus' in the XI century. Probably, they were manufactured in one or several large production centers since the first half of the XI century. The production of standardized crosses and their wide dissemination could have been an important issue in the translation of the new religion to wider groups of the Rus' society.

The study is performed with support by the Russian Foundation for Basic Research, № 17-29-04129.

5 THE CROSS AND THE HAMMER: EVIDENCE FOR THE CONTINUANCE OF PAGANISM IN CHRISTIANIZED ICELAND

Author(s): Cartwright, Rachel (University of Minnesota)

Presentation Format: Oral

The conversion of Iceland to Christianity is dated to the year 1000 AD with a vote held at the Althing. This led to many changes in the ways people were supposed to act especially with regards to the exposure of children, the consumption of horse meat, and burial practices. As one would expect the conversion of an entire country did not happen overnight with material and literary evidence indicating the continuance of some pagan beliefs, some of which can still be seen today (e.g. the belief in elves). This continuance of pagan beliefs can be seen in religiously ambiguous objects, such as the cross/hammer amulets that have been

found throughout Iceland and Scandinavia. This paper will discuss the archaeological evidence that exists in Iceland for the continuation of non-Christian beliefs and practices in the long eleventh century. In addition to the archaeology, literary sources will also be discussed, as they provide further context for the material remains. Rather than a revolution in religious practices, the data suggest hybrid notions and performances during the long eleventh century.

6 THE MATERIAL DIMENSIONS OF PAROCHIAL FORMATION IN NORTHERN ENGLAND, C. 950-1150 AD

Author(s): McClain, Aleksandra (University of York)

Presentation Format: Oral

In England, parochial rights and structures were undergoing a particularly intense process of negotiation and transformation in the tenth, eleventh, and twelfth centuries, eventually resulting in the familiar parish framework of the later Middle Ages. This paper will argue that during this key period of transition between Anglo-Saxon, Anglo-Scandinavian, and Anglo-Norman England, stone church buildings, fonts, and grave markers were not just products of the process of parochialization, but rather bore powerful agency within this emerging network. They were of course functional liturgical structures and objects, and tangible proof of religious rights, responsibilities, and status. But at the same time, they also served as tools through which patrons could simultaneously display individual wealth and contribute to the advancement of their parochial communities, providing them with an important means of navigating religious and political changes, and situating themselves and the churches they patronized in a rapidly shifting social hierarchy. Drawing on architectural and sculptural evidence from northern England, this paper will discuss when and how churches and their parochial territories came into being during the long eleventh century, as well as how patrons and parish communities strategically utilized material culture to lay claim to rights, status, and historical legacies, shaping the parochial system in the process. Given the ubiquity of the parish as an organizational unit in medieval European Christendom and the significance of stone to medieval religious art and architecture, but also the likelihood of chronological variability and highly contextually contingent patterns of development from region to region, it is hoped that this presentation will spark discussion about the comparability of parochial development and its material implications both within England and on the Continent.

7 EMERGING FROM THE SHADOWS: THE DEVELOPMENT OF MEDIEVAL PARISHES IN AN EARLY CHRISTIAN LANDSCAPE

Author(s): Johnson, Andrew (Manx National Heritage)

Presentation Format: Oral

The earlier medieval religious landscape on the Isle of Man is characterised by small chapels, burial grounds and associated monuments, particularly carved stone crosses. About 170 chapels and more than 200 crosses are known, within an island of just 580km². The long eleventh century saw great change in the island's religious landscape. Cross-carving, having reached levels of artistic skill and iconographic content which continues to attract international attention, came to an apparently abrupt end, and the extensive network of early chapels and burial grounds were abandoned in favour of just 17 parishes.

The application of GIS, map-regression and landscape survey is beginning to make sense of some of the contributory factors and decision-making that led to the selection of a handful of sites as the centres of these new parishes. These include accessibility within a predominantly agricultural landscape, proximity to the coast, visibility from the sea, and existing significance as indicated by the presence of earlier pagan Viking burial monuments and stone crosses. The creation of several church estates, for the first time taking land out of secular administrative control, also contributes to the interest of a medieval religious landscape emerging from the shadows of a long early Christian era.

8 MONASTERY OF ST. MICHAEL ABOVE LIM BAY (ISTRIA, CROATIA)

Author(s): Visnjic, Josip (Croatian Conservation Institute)

Presentation Format: Oral

The Monastery of St. Michael is situated next to the Lim Bay, on the Istrian peninsula, in the northernmost part of the Adriatic Sea. It was founded by the Benedictines of the Camaldolese order, probably in the middle of the 11th century. This assumption is indicated by some historical data, but also by the characteristics of the well-preserved large single-nave church of St. Michael with semi-circular apse and partially preserved frescoes. At the place where the monastery was built, there was already a smaller church which, based on the stylistic characteristics, can be dated to the 6th century and which was incorporated into a later monastery. The church of St. Michael is a typical monument of the early Romanesque era and fits perfectly within the architectural type that was promoted by the Benedictine reform activity during the 11th century. The Church is one of the examples illustrating the characteristic of the Istrian space that during medieval period was exposed to the north-eastern Italian and southern German cultural and political influences. Recent archaeological researches have revealed the earliest remains of monastery buildings that were incorporated in later structures, which contributes to a better understanding of the appearance and way of functioning of the 11th century monastery. The lecture will therefore present the earliest phase of the monastery complex of St. Michael which, despite numerous later changes, can still be recognized in preserved building structures, and the formation of the monastery will be placed in the wider context of the Istrian 11th century.

9 THE BALTS AND KIEVAN RUS'. NEW BALTIC CEMETERY OF THE 11TH CENTURY IN UKRAINE.

Author(s): Shiroukhov, Roman (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Baranov, Vyacheslav - Ivakin, Vsevolod (Institute of Archaeology of National Academy of Science of Ukraine)

Presentation Format: Oral

Two years ago Ukrainian scientists found an early medieval cemetery, which will soon become one of the most important archaeological finds in post-soviet Ukrainian history.

Ostriv-1 cemetery is located on the low terrace of Ros' river approximately 100 km. south of Kiev. During 2017-2018 excavations of V.Ivakin and V.Baranov on 1000 square m. 53 inhumation graves with head orientation to the north were found. This kind of burial rite is untypical to the Christian Kievan Rus'. On the other hand, inhumations with the north orientation were characteristic first of all to the Baltic tribes of Semigallians, Selonians, Latgallians, Samogitians as well as to the Curonians (till the 11th century) and Prussians (since the 11th century). This type of burial rite is typical for some Gotlandic 11th century cemeteries and the early Piast Poland. Sambian peninsula Prussians inhumations with north orientation appear within the typical cremation cemeteries area, some of them with Kievan Rus' imported goods. It is important to stress that Sambian peninsula of the 11-12th centuries was the region of the huge Old Ruthenian imported goods concentration.

The most of grave goods of Ostriv-1 belong to the 11th century and are characteristic to the Prussians, Curonians, Scalvians and Semigallians. The penannular brooches from Ostriv-1 are unknown for Kiev Rus', but identical to these, found at Kaliningrad region and West Lithuanian cemeteries.

According to O. Kozak anthropological analysis, the first results of the skeletal remains study demonstrated that the paleopopulation of Ostriv-1 was young and had a low adaptation level, what could be characteristic for the first wave incomers.

At the initial stage of research, we can stress that population of Ostriv-1 consisted of East Baltic region incomers connected to the Jaroslaw the Wise migration and defence politics of the first half of the 11th century, mentioned in Nestor's Chronicle.

10 NORMANITAS IN SICILY

Author(s): Carver, Martin (University of York)

Presentation Format: Oral

The objective of this short paper is to review the impact of the Norman period in Sicily in terms of urban development, rural settlement, agriculture, trade - and demography as indicated by the cemeteries. The 'Norman period' may be defined as running from the first incursions of the Hautevilles in 1061/68, to the occupation of Palermo in 1091, to the creation of the kingdom of Roger II in 1130, to his death in 1154, to the death of Tancred in 1194. At this point Sicily became a dominion of the Hohenstaufen/Swabian regime. During the 150 years in question, the mid 11th to the late 12th century, the character of society and the economy changed in a set of subterranean rhythms that suggest that the policies of successive rulers were not necessarily the prime movers.

The project 'sictransit' sets out to assess the Norman impact on the Greek, Arab and Roman peoples of the island and the consequent achievements of the farmers, merchants and their families of mixed origins whose agency is suspected of being determinant. This paper will ask how far we can identify archaeological correlates that could be described as Normanitas and if so how they were modified by the conquered peoples.

Sictransit is an ERC project of the Universities of York, Rome Tor Vergata and Lecce

<http://sicilyintransition.org>

11 THE LANDSCAPE OF SKYE AND THE WESTERN ISLES IN THE VIKING AGE AND LATE NORSE PERIODS

Author(s): Ryder, Joseph (University of Bergen)

Presentation Format: Oral

The Norse period of Skye and the Western Isles of Scotland began in the late 8th century AD with the first Viking raids, and ends in the mid-13th century with the annexation of the islands from the Norwegian crown to the Scottish crown. This Norse period has traditionally been divided into the Viking Age (790-1087 AD) and the Late Norse period (1087-1266 AD), on the basis of the historical evidence that shows the creation of the Kingdom of the Isles from 1087 AD. The archaeological material of the period between 950-1150 AD shows dramatic changes: the foundations of Norse longhouses go from post and turf built to stone built, Norse pagan burials cease, and many of the pre-Norse monumental structures of the islands were likely reoccupied. Moreover, the islands themselves were integrated into the Kingdom of the Isles, shifting their geopolitical influence from the Jarldom of Orkney to the Isle of Man in the Irish Sea region, and Skye became the seat of the Skeabost diocese, under the authority of the archbishop of Trondheim. In this paper, I will examine the changes that occur in this period through a survey of the archaeological evidence, and take into consideration the role of religion and ethnicity within a landscape context. In this paper, I argue that ethnic, religion and social forces affected the landscape of Skye and the Western Isles during the Norse Period, with an emphasis on the mid-10th to mid-12th centuries.

12 BOHEMIA AND MORAVIA IN THE ELEVENTH CENTURY. A SIGNIFICANT TRANSFORMATION OR A MERE END OF A LONG DEVELOPMENT...

Author(s): Marik, Jan (ARU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)

Presentation Format: Oral

On the historical territory of Bohemia and Moravia, the eleventh century is considered the final phase of the Early Medieval period. Above all, this period is characterised by structural changes, which can be seen as the culmination of previous developments. In the course of the eleventh century, the ruling Přemyslid family laid the foundations of the country's administration relying on a network of strongholds – so-called castellan castles. New functions of these fortified settlements significantly influenced their appearance and ground-plans. This transformation can also be seen in changes of the settlement structure, and even new types of settlements emerged. Another distinct feature of the eleventh century represents the dissemination of Christianity from the elites into the lower social strata. Archaeological sources clearly corroborate that starting from the second half of the tenth century, the number of individual items in the burial equipment significantly declined. The dramatic decline, previously emphasised by archaeologists, in minor objects of material culture has been considerably compensated over the last decade due to the massive use of metal detectors. Entirely new types of archaeological finds have opened up areas for research in the field of technologies in the processing of non-ferrous metals, trade and economy.

13 ROME IN THE LONG ELEVENTH CENTURY. FROM BUILDINGS EVIDENCE TO AN URBAN PROGRAM. THE CITY TRANSFORMATION IN THE EUROPEAN CONTEXT

Author(s): Giannini, Nicoletta (Università Roma Tor Vergata)

Presentation Format: Oral

Aim of this paper is to show some of the results of the research that is being conducted on Medieval Rome, which allowed us to outline how the eleventh century is a crucial moment in the transformation of the city. Starting from the assumption that material culture is the complex of manifestations of people life read through its technical and socio-economic expressions and that architecture and urban planning are an integral part of the material culture, what has been gathered in this research has shown how from the second half of the XI century it is possible to identify the passage in some buildings activities and urbanistic transformation from the early medieval city to the one that will become the twelfth century Rome, not through a long and slow transformation but according to a large urban project implemented right now in this chronological moment.

A comparative study of what was built in city with all the buildings works for the deviation of the river Marana and what happened at street and roads in the same period, is the basis for a new hypothesis about what happen in Rome between the end of Eleventh century and the beginning of the Twelfth century: an important urban project that take care on infrastructures and involved all the city. The interrelation between all the data highlights how all the traces analyzed can be traced back to what is very similar to an "urban program" that starts in the long eleventh century, based on a different way of conceiving space and urban elements, as in other European cities; This urban program represents the background of the transition to that city that appears "other" than the early medieval city and which will be the basis of the great transformations of Rome in the following centuries.

14 CHANGES IN URBAN HOUSEHOLDS IN AD 950-1150 TRONDHEIM, NORWAY

Author(s): Mokkelbost, Marte (University of Bergen)

Presentation Format: Oral

A large excavation in the city of Trondheim, Norway in 1973-1985 uncovered hundreds of early urban houses (c. AD 900-1350). The city layout, buildings and finds have been analysed in several ways, gaining an impression of the organisation of the city, economy, trade, and what early urban life might have been like. However, the central question of how the inhabitants of the city were affected by the large-scale societal changes that occurred during the turn of the century, and how this is visible in the settlement's archaeological material, has not yet been addressed.

My hypothesis is that society on a small scale reflects society on a larger scale; that people were deeply affected by the political, social and religious changes that took place during the long 11th century, consequently altering their lifestyle and thereby immediate surroundings in order to adapt to the changing trends and norms within society.

The household level is regarded as the smallest building block of society, and it is well suited to bridge the gap in middle-range theory. This is where we have the possibility of studying direct responses to large-scale changes in society by looking at the material record. For this presentation, households from AD 950-1150 Trondheim were examined in order to explore changes in households and household organisation throughout this period. A high definition approach was applied in order to investigate the archaeological material on this small scale. Several types of methods, specifically aimed at pointing out changes on the household level, were applied on the households, such as spatial analysis (spatial organisation, access, size etc.), functional interpretations, and contextual analysis of small finds and samples. The following interpretation aims to show the impact of large-scale changes on the inhabitants of this early Norwegian city.

RECENT ARCHAEOLOGICAL INVESTIGATION IN INHABITED MEDIEVAL RURAL SETTLEMENTS: NEW PERSPECTIVES FROM HISTORIC COMMUNITIES PAST AND PRESENT

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Lewis, Carenza (University of Lincoln) - van Londen, Heleen (University of Amsterdam) - Marciniak, Arkadiusz (University of Poznan) - Vareka, Pavel (University of West Bohemia)

Format: Regular session

The archaeological investigation of medieval rural settlements in Europe has a long history, but until recently this mostly focused on deserted villages. Recently, however, the archaeology of non-deserted medieval rural settlements (surviving today as villages, hamlets, farms and small towns) has received more attention. Research-driven interest has been stimulated by awareness that deserted settlements are a minority which may often be atypical, while there have also been sharp rises in the amount of excavation carried out within inhabited settlements in advance of development and, in some countries, community archaeological projects connecting rural residents with their local heritage.

Consequently, one way or another, much more medieval archaeological evidence is now available from inhabited rural medieval settlements than was the case a decade or so ago. However, knowledge of this can often remain restricted to those who were directly involved or local record curators.

This session invites those interested in the medieval archaeology of rural settlements to share recent discoveries, to explore what these are telling us that is new, how it helps us understand the past, and consider what our aspirations should be for the future. Papers will include presentations on specific sites or projects, synthesising overviews looking at 'bigger pictures', and provocative 'think-pieces' challenging current approaches.

Themes include:

- How is excavation and other fieldwork in inhabited rural settlements advancing understanding of their medieval development (origins, expansion, contraction, adaptation, recovery etc)?
- How do the trajectories of still-inhabited and permanently deserted settlements compare?
- How can evidence from inhabited rural settlement studies illuminate wider phenomena? (eg post-Roman change, Christianisation, Viking diaspora, climate change, conflict, the Black Death, resilience, Reformation etc).
- What are the opportunities and challenges for archaeological work in rural communities where today's inhabitants may live in, above or around medieval remains?

ABSTRACTS

1 IT'S DIFFERENT IN THE MOUNTAINS: COMMUNITY ARCHAEOLOGY OF AN INHABITED MEDIEVAL SETTLEMENT IN CENTRAL ASTURIAS, SPAIN

Author(s): Fernández Fernández, Jesús (University of Oviedo; University College London) - Moshenska, Gabriel (University College London)

Presentation Format: Oral

This paper reports on the work and findings of the first four years of the Community archaeology of the commons in Asturias project, a collaboration between UCL and the La Ponte Ecomuseum to investigate the development of the settlement of Villanueva de Santo Adriano from the early medieval period to the present.

In mountainous regions such as central Asturias with restricted space and resources, settlements tend to remain in place. Virtually all villages named in medieval documents in this region have survived into the present: the number of deserted medieval villages is not significant. This hypothesis has been explored archaeologically, and in the case of Villanueva in some detail. Here, a climate catastrophe – heavy rainfall at the onset of the Little Ice Age causing a devastating flash flood – destroyed the core of the medieval settlement, but the new village 'Villanueva' was built only a few hundred metres away (Fernández et al. 2017).

The restriction in this region, where only inhabited villages can be studied, demands a distinctive approach. Our research began with test-pitting to study stratigraphy and collect soil samples, and has extended to the excavation of agricultural land in the village to study its economic basis. This latter excavation – focusing on land buried in the flash flood – has provided materials for pollen analysis, soil chemistry, and radiocarbon dating.

Studying an occupied village means working with a living community: in Villanueva this has been achieved through the La Ponte Ecomuseum, a community-owned heritage centre that coordinates research, promotes tourism through guided tours, and provides a hub for preserving and promoting tangible and intangible cultural heritage.

Fernández, J., G. Moshenska and E. Iriarte. 2017. Archaeology and Climate Change: Evidence of a Flash-flood During the LIA in Asturias (NW Spain) and its Social Consequences. *Environmental Archaeology*

2 SETTLEMENT EVOLUTION BETWEEN LATE ANTIQUITY AND HIGH MIDDLE AGES UNDER ACTUAL VILLAGES : CASE STUDIES IN HAUTE-SAÔNE, EASTERN FRANCE

Author(s): Chevassu, Valentin (UMR 6249 Chrono-Environnement) - Saggese, Adrien - Chenal, Thomas (UMR 6298 ArTeHis)

Presentation Format: Oral

In this paper, we would like to address the problem of documenting medieval settlement evolution within rural areas that are deprived of large rescue archaeology excavations, often seen as the only way to document archaeological remains in the inner part of inhabited villages. We will present here three case studies based upon the results of a survey program launched in 2018 in several villages of Haute-Saône (Bourgogne-Franche-Comté, Eastern France). The aim of the program is to describe the evolution of settlement between Late Antiquity and High Middle Ages in and around actual villages. The work led in these three villages then combine studies of 19th-20th c. archaeological discoveries, analyses of medieval archives and new archaeological field approaches.

The study area was formerly concerned by numerous archaeological researches, due to the activity of local amateurs during the 19th and the first half of the 20th centuries, or afterwards during the 1970s and 1980s. The new study of the written documentation and archaeological items left by these researches has enabled to bring numerous new pieces of information, especially about late roman and early medieval settlement. These data have been completed and precised by the realisation of pedestrian and geophysical surveys, and sometimes by test pits and wall archaeology, in order to relocate ancient discoveries and to bring new chronological data.

Compared to other neighbouring sites, the first results obtained by this study lead to draw some first conclusions about settlement evolution in this area. The changes of the settlement features between classical Antiquity and early Middle Ages can be reassessed in this area, as well as the role played by churches, priories and castles in the reshaping of the settlement during the 10th-12th centuries.

3 THE RETROSPECTIVE DEATHSCAPE: STEĆCI AND THE LIVED SPACE OF MEDIEVAL BOSNIA AND HERZEGOVINA

Author(s): Caval, Saša (University of Reading)

Presentation Format: Oral

Monumental medieval tombstones from western Balkans, called stećci, are mostly unknown to the international archaeological public. Their vast numbers voice the widespread funerary custom of the period between 12th and 16th century when tombstones marked the graves in the countries of modern Montenegro, Croatia, Serbia, but mainly in Bosnia and Herzegovina; the latter has more than 60 000 of these monuments dispersed around the countryside.

Stećci characterise a specific funerary phenomenon and represent a unique interdigitation of traditions, religions, artistic and aesthetic expressions, as well as languages. These monuments embody centuries of Bosnian tolerance, which evolved from long-lasting cohabitation of local, diverse ethnicities and religions. Stećci have an exciting potential to tackle questions around death and burial, the dynamics of political complexities and a continually important topic of religion and society.

As Bosnia is a predominantly rural country, these challenges will expose the ways of life in both, deserted villages and modern villages, hamlets, and small towns originating in the middle ages. This paper tackles the development of medieval rural communities in Bosnia, the comparison between still-inhabited and permanently deserted settlements, and the religious conversions and adaptation in a multi-religious region.

4 ISLAMIC BAYDHA PROJECT: ARCHAEOLOGY OF A RURAL SETTLEMENT IN POST-URBAN PETRA

Author(s): Sinibaldi, Micaela (Cardiff University; Council for British Research in the Levant)

Presentation Format: Oral

The Islamic Baydha Project focuses on archaeological investigations of an Islamic-period village in the area of Bayda, Petra region. The site, which includes village habitations organised in several clusters, a church, and two mosques, has been in use from at least the Nabataean to the Ottoman periods. This continuity of occupation originates from the fortunate geological and climatic conditions which have always made this area one of the most favoured of the Petra region for agricultural activities.

Some of the principal aims of the Islamic Baydha Project are to investigate the range and development through time of the forms and dynamics of settlement in the Petra region during the whole Islamic period and to explore the important relationship between the Petra valley, where settlement continued without major gaps, and its hinterland

The Islamic Baydha Project is a project of archaeological research, conservation, training and community engagement. These components are all well connected, especially because the local community, which lives nearby and has abandoned the village only in the recent past, is deeply involved with the presence of the site.

Involvement of the local community has revealed to be a key element supporting research progress, cultural heritage protection, interest in connecting with the recent past and in sharing ideas for the future of the site.

5 EARLY MEDIEVAL SETTLEMENTS IN THE COASTAL PLAIN OF WEST BENGAL- WORLD'S LARGEST DELTA REGION

Author(s): Basu, Durga (Calcutta University)

Presentation Format: Oral

The present paper intends to highlight the early Medieval Culture in a broad perspective in the coastal plain of West Bengal which has produced innumerable edifices of early medieval settlements in the form of potteries, sculptures, architectural pieces, exposed brick structures, copper plates and objects used in day to day life. The date range of the materials is broadly from 8th / 9th century CE to 12th/ 13th century CE. This phase has been considered as the Early Medieval period in Eastern India. All these materials are discovered from currently inhabited village sites of Deltaic region of the State of West Bengal, an integral part of Eastern India. The coastline of Bengal forms the world's largest deltaic region. Geographical situation is very significant for the development of early medieval habitations in this region. An intricate survey of the different villages in this region carried out for more than three decades and a half has led to the discovery of a large number of early historic and early medieval secular settlements. Some of the Early medieval sites such as Dadpur, Dakshin Gobindapur, Baishata, Mandirtala, Kankandighi and others in South 24 Parganas district in West Bengal would be highlighted in this study.

6 THE BEGINNINGS OF SUZDAL VILLAGES

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

Presentation Format: Oral

Suzdal Opolie, the central part of the Northeastern Rus, was characterized by poor urbanization as well as high density of population in the 10-13 centuries.

The high density is proved, in the first place, by the data from "deserted rural settlements". Their cultural layer has regularly been disturbed by ploughing. In the same time, Opolie still has villages that are known from narrative sources of the 15 century (or earlier) as large settlement complexes. Topographically they lie close to the central sites of the 10-12 centuries; part of them had decayed till the end of the period embraced by the research. It must be admitted that in the local circumstances the research of inhabited medieval rural settlements faces challenges. The most promising spots (areas near churches, red lines of the streets) are often covered with grass or built up. Moreover, even the sectors of modern vegetable gardens have their cultural layers just partly disturbed. That's why the results of the gathering of picked-up items are not as definite for them as they could be for the "deserted sites" that have been ploughed-up for centuries, with their cultural layers disturbed through and through.

One of our aims is to fix the time when the settlement system marked by the existing villages emerged, as well as to see its connection with the previous one. We are also trying to find the way of comparison between the results of total gathering of the picked-up items from the deserted sites and test-pitting of historical villages.

7 CULTURAL HYBRIDITY IN GROBINA ARCHAEOLOGICAL COMPLEX IN THE PRE-VIKING AGE: AN EXAMPLE OF EARLY SCANDINAVIAN DIASPORA IN THE EASTERN BALTIC

Author(s): Sne, Andris (University of Latvia)

Presentation Format: Oral

The coastal areas of the Baltic Sea in the territory of present-day Latvia were sparsely inhabited by the local communities of the Couronians in the middle of the first millennium AD. The local settlement in Grobiņa (present-day urban area) probably consisted of less than 100 individuals before 650 AD, although region was rich in arable lands and had good geographical location close to coast and riverways. It was there where around 650-700 AD the earliest Scandinavian overseas settlement activities took place. Such early chronology is supported by both grave goods analysis and radiocarbon dating. The Scandinavian presence here increased until mid-9th century as evidenced by at least three large cemeteries with around 3000 burials (including both female and male graves). Alongside two Scandinavian communities (coming from Gotland and central Sweden) there existed also local Couronian group, thus presumably these different groups co-existed and perhaps even cooperated in some military or economy activities for two centuries. The later burials of the Scandinavians show clear influence of the local cultural traditions, and gradually the Scandinavian character of Grobiņa is vanished. In these centuries, Grobina was not involved in long-distance exchange networks and rather it was large and rich agricultural community, although regular contacts over the Baltic Sea might be supposed. Several Scandinavian cemeteries and stray finds in the surrounding area and neighbouring regions (near the Venta River and Daugava River) suggest also attempts of inland colonisation and search for new trading ways eastwards. It is still unclear how large was Scandinavian settlement (cultural layer in Grobina covers about 20 hectares but it may largely relate to inhabitation of Middle and Modern ages) and how did it cease to exist, while traditionally it is attributed to the military raid by the Swedes in 854 described later by Rimbert in his Vita Anskarii.

8 FARMS IN FJELIE IN SOUTHERN SWEDEN UNDER THE SURFACE

Author(s): Schmidt Sabo, Katalin - Lindberg, Sofia (National Historical Museums, The Archaeologists)

Presentation Format: Oral

In 2016, a large archaeological survey was carried out in the village Fjelite in Southern Sweden. According to older maps, three farms were located on the site. Traces of buildings from the Viking Age were found, which were part of a Viking age / early-medieval main farm that existed before the village Fjelite was established. It is only from the beginning of the 13th century that the

three farms appear, probably after the landowners' land holdings were reorganized.

Two farms had a continuous settlement until 1800, while one had a deserted period between 1400–1600, probably as a result of the plague. Several ovens revealed that the farmers had been working with beer brewing alongside agriculture and also handled fish in large quantities.

During the Middle Ages was barley the most common grain, from 1600 it was rye. Animal husbandry seems to have been successful. Milk cows and pigs may have been brought to the town for slaughter and there were signs of specialization on goose grooming. In the kitchen gardens they cultivated cabbage plants, peas and flax, in order to expand with more plants during late medieval times. The farms were family-based agricultural units that required the peasants to have good coordination and co-operation. Although they did not own the land, we see that there was room for them to find different opportunities for surplus production.

9 TRACING THE LONG-TERM DEVELOPMENT OF THE MEDIEVAL RURAL LANDSCAPE AT THE NATIONAL TRUST'S WALLINGTON ESTATE (NORTHUMBERLAND, UK)

Author(s): Vervust, Soetkin (Newcastle University; Vrije Universiteit Brussel) - Kinnaird, Tim (University of St Andrews)

Presentation Format: Oral

The 5250 ha rural Wallington estate has been a National Trust property since 1958. Apart from a late 17th century country house within wooded pleasure grounds, almost all of the estate is agricultural land, divided into 15 separate farm holdings. The Wallington landscape we see today has been heavily shaped by estate management in the 18th and 19th centuries. The settlement pattern is one of dispersed farmsteads, while the field systems largely reflect the orderly rectilinear layout of planned enclosure, with small rectangular fields divided up by long and straight stone-faced banks. Yet, in medieval and early modern times the outlook of the landscape is believed to have been markedly different, with nucleated villages amidst more irregularly shaped open fields which were farmed collectively.

This pattern of long-term landscape change, from open to more enclosed field systems, has been inferred across the whole of Northumberland. It is however very difficult to gain a more detailed understanding of this process, because the origins and development of historic earthwork boundaries and remnants of arable farming are often poorly understood as absolute dating evidence is generally lacking.

To establish a more robust chronology, the project presented here used OSL profiling and dating. Based on a retrogressive landscape analysis of documentary evidence, archaeological data, aerial photographs and cartographic materials for the estate, five areas were selected for further archaeological investigations and OSL sampling. This data was incorporated in a multi-temporal historical GIS to provide more detailed spatial and temporal models of land management and settlement in and around Wallington, from land re-organisation at the end of the 16th century, through early land use in the 11th century. Moreover, at one site, one prominent boundary tantalizingly dates to the 5th to 6th centuries, suggesting that post-medieval land divisions sometimes trace much earlier land ownership rights.

10 RECONSTRUCTING CHANGE IN RURAL SETTLEMENTS: INTERPRETING POTTERY FINDS FROM 'TEST PIT' EXCAVATIONS IN INHABITED SITES IN ENGLAND

Author(s): Lewis, Carena (University of Lincoln)

Presentation Format: Oral

This paper explores the outcomes of a programme of one-metre square archaeological 'test pit' excavations within currently occupied rural settlements (CORS) in England. Here, only around 10% of medieval settlements subsequently became permanently deserted, and these are in any case atypical, being on average smaller, less favourably located and very unevenly distributed when compared to their non-deserted counterparts – today's villages, hamlets and small towns. Thus it is vital that research into rural settlements includes sites which are still inhabited today, but this can be difficult due to their presently built-up character. One solution to these difficulties is the use of a sampling strategy involving the excavation of multiple very small trenches which can be squeezed into unbuilt-up spaces such as gardens within today's rural settlements. Over 13 years, the English CORS Project has involved the excavation of more than 2000 such 'test pits' in more than 60 settlements, and mapped the distribution of pottery of different dates to reconstruct which parts of settlements were inhabited at different times. This paper considers what such data are telling us that is new about the long-term development of rural settlements, selecting two themes for particular focus: firstly the widespread nature of evidence for dynamic volatility which suggests that turbulent change was a near-universal experience for settlements in the medieval period (and not just restricted to deserted sites); and secondly exploring evidence which suggests that many 19th century settlement plans (often presumed to represent earlier layouts) are of relatively recent origin, dating in many cases not to the medieval period but later. The paper concludes by noting that similar techniques could be used effectively elsewhere in Europe.

11 REFLECTIONS ON THE COBHAM VILLAGE DIG, COMMUNITY ARCHAEOLOGY IN KENT, UK

Author(s): Mayfield, Andrew (Kent County Council; Shorne Woods Archaeology Group)

Presentation Format: Oral

The Cobham Landscape Detectives project saw local people, youth groups and school children investigate the archaeology and history of Cobham parish, in the County of Kent, UK. As part of the wider project, the village of Cobham was invited to take part

in two seasons of test pit surveys. Over the summers of 2017 and 2018 holes were dug across the village as we attempted to answer a series of questions. Was there any evidence for Saxon activity? How far could we push back the archaeology of the site and where were the Medieval manors that once surrounded the village? In addition to the test pits, LiDAR data was studied and investigated on the ground, old maps were interrogated, aerial photos examined and a drone used to take new photos of the area. Oral history testimony also added to our understanding of the recent development of the village. This paper will set out the findings of this three-year, Lottery funded, community archaeology project. It will also evaluate the approaches used and challenges encountered in delivering these types of activities.

12 COMMUNITY ARCHAEOLOGY IN HET GROENE WOOD (NL) - SYMBIOSIS OF SCIENCE AND SOCIETY

Author(s): Verspay, Johan (University of West-Bohemia; University of Amsterdam) - van Londen, Heleen (University of Amsterdam)

Presentation Format: Oral

Archaeological excavations in Brabant (BE & NL) have revealed a puzzling development of the medieval settlement. Around the early thirteenth century the coversand area saw a widespread settlement relocation. Across the region the traditional settlement locations amidst the fields were abandoned and the settlements were relocated, sometimes even leaving behind their church. It is assumed that the inhabitants moved to the sites of the present-day villages, although so far archaeological evidence to back this up has been scarce.

The data on medieval rural settlement primarily stems from the countryside. Very few excavations have been conducted within the historical villages themselves. Because of this, our understanding of the development of rural settlement is mainly based on deserted settlements. This imbalance is problematic, as the relation with the development of the historical villages remains unclear. Since archaeological research in the area is solely development-led the bias in our dataset will only continue to increase.

To address this problem a purposeful research project was created to study the origins and development of the historical villages. Since the villages are presently inhabited the required archaeological observations will inevitably intrude into private property. This was not regarded as a problem, but rather an opportunity to involve the inhabitants in the exploration of their own village and we adopted a community archaeology approach. This initiative received great local support and we are now working with seven village communities in the Groene Woud area in North-Brabant (NL). In this paper we will present our initial findings.

A. ARCHAEOLOGICAL AND ARCHAEOZOOLOGICAL INVESTIGATIONS IN THE MEDIEVAL SETTLEMENT OF ENISALA (TULCEA COUNTY, ROMANIA)

Author(s): Stanc, Simina Margareta (Alexandru Ioan Cuza University) - Stănică, Aurel Daniel (Eco-Museum Research Institute Tulcea) - Cabat, Alexandra - Malaxa, Daniel (Alexandru Ioan Cuza University, Iasi) - Bejenaru, Luminița (Alexandru Ioan Cuza University, Iasi; Romanian Academy-Iasi Branch, Olga Necrasov Centre of Anthropological Research)

Presentation Format: Poster

In 2014, an archaeological preventive research was carried out outside the build-up areas of the settlement, the commune Enisala Sarichioi, in the Enisala Fortress archaeological site, in order to realise the investment "Emphasizing the historical heritage - the Enisala Fortress, specific to the Sarichioi fishing area, Tulcea County" funded by the Operational Program for Fisheries 2007-2013, beneficiary the "Gavrila Simion" Eco-Museum Research Institute in Tulcea. In the project mentioned above, a sanitary group and septic tank were wanted. Given the small area of 43.67 square meters of the two objectives, a surface research was preferred.

In the two surfaces (S1-S2) a number of 13 pits were investigated. In S1, 10 pits were investigated, and 3 were investigated in S2. In 13 residential complexes, a variety of materials were discovered - ceramic fragments, animal bones, fish bones, fish scales, a raw deer horn, iron arrow tips, a sewing needle, a knife blade, an iron sleeve and an iron horseshoe (fragmentary). In the lower part of these complexes a small number of ceramic fragments were found, to which the faunal material was added. The ceramic material dates the complexes researched in the second half of the 15th century.

685 faunal remains have been collected: 49 of fish, 12 of birds and mostly of mammals (624 remains). Domestic mammal remains have the highest frequency (84%) and the identified species are: *Bos taurus*, *Ovis aries*, *Capra hircus*, *Sus domesticus*, *Equus caballus*, *Canis familiaris*. Cattle is dominant, followed by sheep/goat and pig. Six species of wild mammals have been identified: *Cervus elaphus*, *Sus scrofa*, *Capreolus capreolus*, *Bos primigenius*, *Lepus europaeus*, *Canis lupus*.

This work was supported by a grant of Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P4-ID-PCE-2016-0852, within PNCDI III.

B. COMMUNITY ARCHAEOLOGY IN A SURVIVING MEDIEVAL RURAL SETTLEMENT IN IRELAND - THE OLD ROSS RESEARCH PROJECT'S (THORRP) SUCCESSSES AND CHALLENGES

Author(s): Marshall, Sinead (MOLA)

Presentation Format: Poster

This poster briefly considers the successes and challenges of ThORRP, with suggestions for future opportunities and actions specific to its Irish context.

The archaeological investigation of a medieval rural borough at Old Ross, surviving today as working farms and a modern village,

was undertaken by a team of professional archaeologists and volunteers. A non-invasive community archaeology approach, centring events and presentations on the land and in the local gathering places, helped build local awareness of individual sites forming part of a whole settlement and encouraged interaction with the project. Fieldwalking, Geophysics, LiDAR analysis and documentary research fed into the resulting report and publication. The discoveries include hints of the medieval borough's origins combined with further evidence of its layout, enriching state records with new information on many of the known sites within the settlement as well as newly discovered sites and artefacts. Our understanding of the community's views of the settlement developed over time as did their thoughts on archaeology in relation to their daily lives.

However, our ultimate aim of contributing to preservation of the archaeology through connecting rural residents and landowners with their local heritage met challenges both during and after the project's lifespan. Working farms adapt to new regulations and a competitive market while generations of rural families wish to build new homes on their ancestral land. Both may impact on known archaeological remains and those just in the process of being discovered and recorded.

Finally, ideas for preserving the borough of Old Ross while working with this rural community in Ireland are presented.

43 THE POLITICAL GEOGRAPHY OF WESTERN ANATOLIA IN THE LBA, AND THE REGION'S INTERACTION WITH ITS NEIGHBOURS, IN PARTICULAR THE BALKAN

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Zangger, Eberhard (Luwian Studies) - Kelder, Jorrit (University of Leiden) - Hajnal, Ivo (University of Innsbruck)

Format: Regular session

Whilst we know of numerous Late Bronze Age (c. 1700-1200 BC) sites, including a number of very sizable ones, in western Anatolia, remarkably little archaeological fieldwork has focused on uncovering these settlements and establishing their role vis-a-vis their surroundings. Contemporary texts similarly indicate that the region was of a major political and military importance, and that individual states and federations may have ultimately challenged Hittite hegemony over Anatolia. Yet most text books largely ignore the region's importance, and consider it as a conflict zone between the two great powers to its west (Mycenaean Greece) and east (Hatti). This session invites presentations that aim to redress this situation. We are particularly interested in papers where evidence from various relevant disciplines, including archaeology, philology, linguistics, and geology/geo-archaeology are combined and compared. The session aims to contextualize the role of western Anatolia during the LBA and the interactions with its neighbours (including Greece, central Anatolia, the Levant, Egypt, Cyprus, and the Balkan), by inviting papers discussing fieldwork results as well as new interpretations of available archaeological and philological evidence. The session aims to present western Anatolia not simply as buffer zone between other regions and states, but as a region with its own socio-political and cultural developments, that was fully integrated in the LBA world.

ABSTRACTS

1 INTRODUCTION: THE LUWIANS AND THEIR CONTEMPORARIES IN LATE BRONZE AGE WESTERN ASIA MINOR

Author(s): Zangger, Eberhard (Luwian Studies)

Presentation Format: Oral

Whilst we know of numerous Late Bronze Age (LBA; c. 1700-1200 BC) sites, including a number of very sizable ones, in western Asia Minor, remarkably little archaeological fieldwork has focused on uncovering these settlements and establishing their role vis-a-vis their surroundings. Contemporary texts indicate that the region was of major political and military importance, and that individual states and federations at times challenged Hittite hegemony over Anatolia. Yet most text books largely ignore the region's importance and consider it as a conflict zone between the two great powers to its west (Mycenaean Greece) and east (Hatti). To overcome the rigid Eurocentric paradigms at the core of Aegean prehistory, a discipline conceived by Arthur Evans a century ago, it has recently been suggested to use "Luwian" as an umbrella term for the petty states and various ethnic groups which populated western Asia Minor during the Middle and Late Bronze Age. This session now aims to contextualize the region's role and the interactions with its neighbours – including Greece, central Anatolia, the Levant, Egypt, Cyprus, and the Balkan. By scrutinizing the archaeological and philological evidence from all sides of the Aegean as well as the Balkan, and by discussing fieldwork results and new interpretations of available evidence, the session aims to present western Anatolia not simply as a buffer zone between other regions and states, but as a region with its own socio-political and cultural developments, that was fully integrated and played an active role in the LBA eastern Mediterranean.

2 WEST OF TROY – AN INTERDISCIPLINARY APPROACH

Author(s): Hajnal, Ivo (University of Innsbruck)

Presentation Format: Oral

Prehistoric Thrace is of particular interest due to its proximity to Northwest Asia Minor and above all to Troy. It is widely accepted that East Thrace and West Asia Minor have maintained close cultural contacts since the beginning of the Chalcolithic period (since 6000 BC).

However, the links between Thrace and Northwest Asia Minor are not equally intense in all periods. Like in the chalkolitic period, a significant proximity can be observed towards the end of the Bronze Age (see Aslan et al. 2014, 204). The ceramic findings lead Hnila (2012, 214-216) to assume the immigration of new populations from Thrace for Troy VIIb2. Though the detailed interpretation of the findings points to a complex scenario, this analysis seems to be widely accepted (see Grave et al. 2013).

The paper starts at this point. It wants to augment the archaeological findings on the Thracian-Anatolian contacts with findings from other disciplines as follows:

- Linguistics has recently gained a more precise picture of prehistoric migrations (see Anthony/Ringe 2015). The linguistic prehistory of Thrace has also been illuminated by new finds from the first pre-Christian millennium (see Brixhe/Panayotou 1994; Brixhe 2006).
- Archaeogenetics is now able to precisely trace the development of populations in Europe and Asia Minor into the late Bronze Age (see Allentoft et al 2015; Haak 2015; Kristiansen 2017).

The interdisciplinary combination of the available information should lead to new scenarios and sketch the environment of prehistoric Northwest Asia Minor more clearly than hitherto possible.

3 SOUTHEASTERN BALKANS AND THE LBA AEGEAN-ANATOLIAN NETWORK

Author(s): Vassileva, Maya (New Bulgarian University, Department of Mediterranean and Eastern Studies)

Presentation Format: Oral

Up until today, no general overview of the Late Bronze Age (LBA) in Bulgaria exists. What is more, the ceramic typology and archaeological stratigraphy is less well developed for the LBA when compared to earlier or later stages. Also, the transition between LBA and the Early Iron Age (EIA) remains unclear in Bulgaria and Thrace as many features and pottery shapes continued well into the 1st millennium BC.

It is obvious that both, western Anatolia and southeastern Thrace, participated in the LBA East Aegean trade and cultural network. While Aegean affinities have been acknowledged in the past few decades, Balkan-Anatolian interactions remain understudied. Anatolian-inspired pottery shapes were found in a few sites in southeastern Bulgaria: Dragoyna (in the Rhodope Mountains), Drama near Yambol and Vratitsa near Burgas. These finds resemble wares known from Troy VI and VII. Reciprocally, greyware of Balkan origin was found in Troy VIIb1. Both, Thrace and Anatolia (e. g. at Daskyleion and Gordion), saw a revival of this type of pottery during the 1st millennium BC.

Metallurgy was crucial for the prosperity of LBA societies – and exploitation of gold, silver and copper mines has recently been recorded from the Balkan. Temporary LBA settlements and sanctuaries appeared in the vicinity of these mines. Ada tepe near Krumovgrad in southeastern Bulgaria is one of the best studied sites of this type.

This paper will present two artefact types as case studies to improve our understanding of the metal trade network: the distribution of LBA stone scepters and copper ingots. The southeastern Balkan benefitted increasingly from exchange with other regions in the Eastern Mediterranean from the 15th century BC onwards. Archaeological findings may indeed help improving our understanding of the ethnic and cultural situation in southeastern Thrace and northwestern Anatolia during the Late Bronze Age.

4 IN SEARCH OF A 'LUWIAN' STATE: REGIONAL ANALYSIS OF THE LATE BRONZE AGE IN THE KONYA PLAIN, TURKEY

Author(s): Bachhuber, Christoph (University of Oxford) - Massa, Michele (British Institute at Ankara)

Presentation Format: Oral

One of the largest challenges in archaeologically identifying 'Luwian' socio-political entities in Late Bronze Age Anatolia is the close association between Luwian monumental inscriptions and Hittite hegemony. In this paper we draw together wide-ranging data from the Konya Plain in south-central Turkey, in particular recent results of the Konya Regional Archaeological Survey Project (KRASP), to suggest that one such socio-political entity might be located in the Konya Plain. We discuss Luwian-inscribed monuments in the orographic margins of the Plain in relation to a number of meaningful patterns in settlement and land use. These include: 1) large-scale urbanization in the second millennium BC; 2) the proliferation of new settlements in marginal landscapes during the Late Bronze Age; 3) the establishment of a defensive network of hilltop fortifications around the Konya Plain by the early second millennium BC, and probably earlier.

The paper revisits the Tarhuntašša problem, but supported by these extensive regional survey data and a comparative literature on the archaeological landscapes of early state entities. Whilst both the 'Luwian' identity of the Late Bronze Age inhabitants of the Konya Plain and the identification of one or more sites with the Tarhuntašša capital remains conjectural at best, future research of KRASP will be guided by these and related considerations."

5 AN IMPORTANT BRONZE AGE SETTLEMENT IN INLAND WESTERN ANATOLIA: INTENSIVE SURVEY PROJECT OF TAVŞANLI HÖYÜK AND ITS SURROUNDINGS

Author(s): Türkteki, Murat - Fidan, Erkan (Bilecik Şeyh Edebali University)

Presentation Format: Oral

The Eskişehir and Kütahya provinces survey project (Turkey), started in 2017, has three main aims: (a) identifying previously-unknown settlements in the western Anatolian highlands; (b) investigating prehistoric metal mining activities; (c) shed light on the

political geography of the region during the Middle and Late Bronze Ages.

As part of this effort, we intensively surveyed the mounded settlement of Tavşanlı Höyük (Kütahya). The systematic collection of archaeological materials on the mound itself and on the surrounding plain indicates an occupied area exceeding 40ha. Furthermore, geoarchaeological corings carried out in the plain and radiocarbon analysis from charred materials suggest the existence of a lower settlement already in the middle Early Bronze Age.

The preliminary results presented here indicate that Tavşanlı Höyük was one of the biggest centres in the region during the 3rd and 2nd millennia BC, due to its strategic location on a major route between the Aegean coast and the central Anatolian plateau, as well as its proximity to important copper and silver deposits.

6 A SPATIAL INVESTIGATION OF THE DISTRIBUTION OF LATE BRONZE AGE SETTLEMENTS IN WESTERN ANATOLIA

Author(s): Asinmaz, Alper (Dokuz Eylül University)

Presentation Format: Oral

Due to its favorable geographical condition, the Western part of Anatolia harboured numerous settlements during the Late Bronze Age. Although only few Late Bronze Age centers were previously known in detail, now we know more about the minor settlements in the region thanks to the increasing number of researches and growing interest. Also, recent researches and new interpretations on the material culture have changed some aspects of the former theories. In this context, since the number of known LBA sites have increased, attention to the settlement patterns and settings of the sites has indispensably increased likewise. Thus, this situation brings new perspectives to the concept.

Spatial analyses, spatial thinking and statistics in archaeology have been good methods to understanding settlement patterns and underlying reasons of settlement distributions. In this sense, GIS has been a useful tool for analysing the mentioned phenomenon. In this paper I will analyse the patterns and the distributional organization of LBA settlements in Western Anatolia. Thus, relying on the results of the analysis, inferences regarding the settlement patterns will be made. Also, the effect of geography on the regionalization will be discussed. Since analysing the whole region will be too complex for this type of study, a certain part of the region -namely Inner West Anatolia- won't be included in the study area.

7 LATE BRONZE AGE OF ISTANBUL

Author(s): Aydingun, Sengul (Kocaeli University)

Presentation Format: Oral

Istanbul is situated at the crossroads of two continents and major sea lanes between the Black Sea basin and the Aegean. However, until the excavations of Bathonea on the shores of the Küçükçekmece Lagoon Lake started in 2009 no evidence for human existence had been recovered from the 2nd millennium BC.

Materials:

Two Hittite type iron figurines, one lead figurine and a number of Hittites ceramics fragments belonging to fourteen distinct pitchers had been recovered in the excavations of İstanbul Küçükçekmece Lake Basin Bathonea excavation's from the sectors 8-24. III. level of sectors are $\nabla+9.50$ - $\nabla+9.06$ m. Additionally, a well-known Cyprus White Slip II ceramic piece from 2. Millennium BC, two Mycenaean ceramic fragments and further Balkan ceramics from the same era were also recovered from the same context. Besides architecture, a crate shaped warehouse and some walls were found. The architectural traces were came from under 30 cm of sea sand.

Goals and Methods:

In order to answer the questions of how these artefacts might have reached the region, it is necessary to examine the relations of the Hittites with West Anatolia, as recorded in their texts, and to compare the findings with the archaeological material of West Anatolia.

It is obvious that the Hittites were closely interested in Western and Northwestern Anatolia since the early years of the Kingdom.

The most remarkable information about the Hittites'expansion to the Northwest Aegean and Marmara region is recorded in the Tuthalia I/II text, declaring war with the Aššuwān Confederacy. In the aftermath of this event, Hittites seem to have established close relations with Troia and annexed the region to the south of Marmara, declaring the king of Masa Land as vassal. The Hittites may also have passed into Thrace over the sea from this region.

8 A RE-INTERPRETATION OF THE LATE BRONZE AGE CHRONOLOGY AT BEYCESULTAN BASED ON C-14 DATING

Author(s): Kourkoulakos, Antonios (University of Münster)

Presentation Format: Oral

The excavations by James Mellaart and Seton Lloyd at Beycesultan in central western Anatolia during the 1950s revealed an extensive settlement with continuous habitation layers from the Chalcolithic to the Late Bronze Age. Beycesultan thus became (after Troy) the second Bronze Age settlement in western Asia Minor to be excavated on a large scale. In the course of the renewed investigations led by Eşref Abay after 2007, ten C-14 samples were taken from layers 5b-5a/II-Ib. Their analyses now lead

to a re-evaluation of Beycesultan's chronology.

Based on ceramic typology, Mellaart attributed layer Ib (5a) after the 12th cent. and level II (5b) to the 13th cent. (all BCE). The C-14 samples, however, now suggest that the layers 5a/Ib and 5b/II, which had been placed between ca 1100 and 1300, ought to be dated to 1830-1685 at the earliest and (even more likely) 1530-1410 at the latest.

This change in dates for two Late Bronze Age layers has major repercussions for the interpretation of the site. Using the Hittite texts, it is now possible to contextualize the site in a wider geo-political framework vis-à-vis Arzawa and Hatti. What is more, a big percentage of the 24 newly introduced pottery shapes of layer 5a/Ib are now synchronous with ceramic styles in the Hittite core region. Furthermore, it can be shown that the big fire that destroyed layer 5b/II can now be plausibly placed in the period of the so-called Assuwan confederacy – and it may thus reflect a military advance under the rule of Tudḫaliya I/II.

9 THE LINGUISTIC LANDSCAPE OF MIDDLE AND LATE BRONZE AGE WESTERN ANATOLIA

Author(s): Kloekhorst, Alwin (Leiden University)

Presentation Format: Oral

Not much certain is known about the ethnolinguistic make-up of Western Anatolia during the Middle and Late Bronze Age: the contemporary sources from this area are sparse (a few hieroglyphic inscriptions) and it is debated what they signify (are they in Luwian or not?). In the present paper I will offer a reconstruction of the linguistic landscape of Western and Central Anatolia in the 2nd millennium BCE based on contemporary sources (Old Assyrian texts, Hittite texts) as well as later ones (from the 1st millennium BCE). It will be argued that in this period this region must have been home to several languages (most of which belong to the Anatolian branch of the Indo-European family), and that, at the end of the Bronze Age, some language shifts took place that were caused by population movements, partly from the Balkans into Anatolia (Phrygians and Mysians). This has repercussions for our view on the (linguistic) prehistory of the speakers of the Luwic languages.

10 IN SEARCH OF THE MISSING LINK. WRITING IN WESTERN ANATOLIA DURING THE LATE BRONZE AGE

Author(s): Waal, Willemijn (Leiden University)

Presentation Format: Oral

As has often been pointed out, there is a conspicuous scarcity of written sources from western Anatolia during the Late Bronze Age; attestations of writing are limited to a small number of rock inscriptions and some incidental inscribed objects. This is in sharp contrast to the neighbouring regions Central Anatolia and the Aegean, where various – sometimes elaborate – archives have been unearthed. As a consequence, we are not only much less informed about western Anatolia, but it is sometimes also assumed that not much writing was going in this area. This impression is, however, deceiving and there are indications that in western Anatolia use was made of perishable writing materials, such as wood. A well-known example is the reference on a Hittite clay tablet to wooden documents in relation to the kingdom of Wilusa in the Troad region. These wooden records were presumably inscribed with Anatolian Hieroglyphs. The origins of this script are debated, but there are reasons to think that its birthplace may have been in western Anatolia, notably because of the resemblances to the early Aegean writing systems. In both Anatolia and the Aegean, pictographic signs appear on seals from the third millennium onwards and in the second millennium several scripts emerge: Linear A (and B) and Cretan Hieroglyphs in the Aegean and Anatolian Hieroglyphs in Anatolia. These writing systems show some striking formal similarities: they are, e.g., all pictographic, combining logographic with syllabic writing, consisting predominantly of Consonant-Vocal (CV) signs. This is all the more significant, since these characteristics are not shared by the already existing writing systems of Mesopotamia and Egypt, which are generally seen as their source of inspiration. This paper will address the use of the Anatolian Hieroglyphs in western Anatolia and explore the possibility that their roots may lie in this region.

11 THE RELATIONSHIP BETWEEN HIEROGLYPHIC AND CUNEIFORM LUWIAN. REFLECTIONS ON THE ORIGINS OF ANATOLIAN HIEROGLYPHS

Author(s): Breyer, Francis (University of Bonn)

Presentation Format: Oral

For a long time, the Anatolian hieroglyphics were considered »Hittite« and it was only in the 1970s, when the close relationship to the Luwian language was discovered by the redefinition of some phonetic values. Today we speak of Hieroglyphic Luwian as opposed to Cuneiform Luwian. Recently, however, the special relation to Luwian has been called into question again (Yakubovich). Be it as it may – the crucial question still remains: how exactly do Hieroglyphic and Cuneiform Luwian differ from each other and why? One variety is written with pictorial signs, the other in some Anatolian form of cuneiform writing. The details of the linguistic differences have long been well-known. The big problem, however, is still unresolved: how are these differences to be evaluated? The difficulty here is the very fact that there is no sequence or dichotomy between Hieroglyphic and the Cuneiform Luwian in terms of time or space. In other words: they are neither two different dialects nor two different linguistic phases. So far, there have been surprisingly few concrete proposals to solve this problem. That they could be different sociolects, as suggested by Frank Starke in 1997, is very unlikely, since the producers of both groups of texts came from the same upper class of the Hittite Empire. In the present contribution, another variation linguistic approach is to be pursued, supplemented having a closer look at similar difficulties in other disciplines with pictorial writing systems (Egyptology, Maya Studies). After weighing up several approaches, the hypothesis is finally put forward that the two corpora are not just two types of writing systems but also different types of what generally is called functiolects.

12 ARZAWA, ASSUWA, AND MIRA: THREE NAMES FOR ONE AND THE SAME COUNTRY IN WESTERN ANATOLIA

Author(s): Woudhuizen, Fred (Dutch Archaeological and Historical Society)

Presentation Format: Oral

In the present paper the evidence concerning the geographic names Arzawa, Assuwa, and Mira from Hittite, Luwian hieroglyphic, Egyptian and Mycenaean sources will be reviewed in order to determine whether these are three distinct countries or multiple references to one and the same realm in western Anatolia. Starting point will be that in the Hittite, Luwian hieroglyphic, and Egyptian hieroglyphic sources there can be found evidence that Arzawa, Assuwa, and Mira, each at its own period, reached the preeminent status of a great kingdom. In principle, there is room in western Anatolia only for one great kingdom, by and large corresponding to Lydia of the Archaic period.

In addition it will be investigated how the Homeric data on western Anatolia fit in with the Late Bronze Age evidence on the topic. In doing so, it appears that Homer is ignorant of the country names Arzawa, Mira, Seha and Masa, but uses Maionia and Mysia instead.

13 POSSIBLE COASTAL LUWIAN SETTLEMENTS IN THE NORTH-EAST AEGEAN

Author(s): Taskin, Sefa (Independent Resercher)

Presentation Format: Oral

Today, it is communis opinio that during 2nd millennium BC, Luwian was the predominant language spoken in western, southern, and central-southern Anatolia. Indeed, the toponyms and names of many archaeological sites in this extensive region can be traced back to Luwian roots or sounds, or are indeed still Luwian. Maddunašša was one of the biggest settlements in the Še a River Land which can be most likely located in today's Caicos-Hermos valley. Its Luwian name stands for "place of vine" and indeed the area is still today occupied by vineyards. In a similar way, the modern Zeytindağ (Olive Mountain) of Bergama, was known in Classical times as Eleia (olive in Greek), but its Luwian name was Dainiš (dain- is oil in Luwian). Again, olive orchards still determine the landscape there today. Moreover, the remains of Panaztepe, an important settlement on the coast of Aegean, are considered to represent Pa-ni-iš-ša, a Luwian sounding place mentioned in Hittite documents. Strabo mentions a promontory called Malia on Lesbos whose name can be equated with that of a Luwian goddess Malia.

It is fascinating to see, that probably 2500 years after the Luwian has vanished, many toponyms in the north eastern coastal regions of the Aegean are still based on Luwian words and sounds: Temnos, Hermos, Larissa, Lake Gyges, Belendi, Selendi, Tabala, Bergama, Mt Pindassos, Kimindenia, Sindel, Pitane, Dainis, İlya, Apan Fountain, Hula Hill, Attaea, Atarneus, Pisa, Sandania, Indipedia, Antandros, Pedesa, İvrindi, Sındırgı, Ryndikos, Apolyont, Pandermas, İmralı, etc. Among the north Aegean islands the names with Luwian roots are Cunda, İmbros, Tenedos, Limnos, Myrina, Mondros, Antissa, Erossos, Mandamados, Mytimna, Skamnia, Mt Ordymnos, Mt Leptymnos, Cape Malia of Lesbos (Lazpa), etc. Based on these toponyms which have Luwian roots/sounds, the region on which the language was spoken can be reconstructed.

14 STATUS DISPLAY IN LATE BRONZE AGE AND EARLY IRON AGE SANCTUARIES REVIEWED - WHAT SHAPES A FIND ASSEMBLAGE?

Author(s): Berndt, Ulrike (None)

Presentation Format: Oral

Questions of status and cult in the Aegean Bronze Age and Early Iron Age of Greece have traditionally been discussed in terms of different "strata" of Late Bronze Age religious expression, accessibility to sanctuaries and the importance of sanctuaries as meeting places, boundary markers, and social arenas for the display of status markers and/or prestige goods.

This paper examines how changing the sociopolitical framework influences questions of status display in sanctuaries across the Late Bronze Age - Early Iron Age-Transition in Greece by comparing inventories from sanctuaries of both chronological periods with those of contemporary settlements and burials. It will ask, how the find assemblage we look at as archaeologists came to be - what objects can conceivably be expected within a sanctuary? What rules may explicitly or implicitly govern the suitability of an object for its use in the cult? Which role do economic considerations play, especially when it comes to the shifting trade networks at the end of the Bronze Age? What kind of influence does a highly hierarchical society like the one during the Mycenaean palatial period have on how cult is conducted, as opposed to the social structures of the Early Iron Age? The archaeological record will be supplemented by a look at the written records of the Linear B tablets and Homeric Epic, to gain a more detailed insight into the processes that formed the find assemblages on a macro-, meso-, and micro-level, from larger societal influences down to regional needs and potential individual considerations.

15 HITTITE DOCUMENTS REFERRING TO CONTEMPORARIES ABROAD - AND THEIR IMPLICATIONS FOR DATING THE TROJAN WAR

Author(s): Giannakos, Konstantinos (Association for the Research of Ancient-Greek and Byzantine Technology)

Presentation Format: Oral

Official diplomatic documents, handed down from the Land-of-Ḫatti, describe the political developments in Anatolia between 17th-12th century BCE -used in correspondence with states adjacent to Ḫatti-, and reflect transnational relations (either peace-

ful or fierce). The famous documents mentioning Ahhiyawa date to the 15th/14th-12th century BCE and yield a valuable Hittite perspective of international affairs. The contents of these documents are presented in relation to the archaeological evidence from Egypt, Cyprus, Levant and Greece. Ahhiyawa appears to reflect a state on the Greek mainland and some Aegean islands that is not recorded as such in later Greek literature and most likely reflects Mycenaean Greece. This state assumed an active role in diplomatic relations across the eastern-Mediterranean from the late-15th century BCE onwards, powerful enough to disturb the Hittite Kings. Under Ammuna's reign, during 15th century BCE, the weakened Hittite kingdom was restricted to central Anatolia. Tudḫaliya I/II expanded their realm westwards. Subsequently, times of weakness alternated with times of strength followed. Archaeological evidence suggests that during early-LH-1350/1320BCE period, Mycenaeans (i.e. Ahhiyawans) enjoyed their greatest prosperity and power, evidenced by the cutting-edge technological level of archaeological remnants. The 'Great Powers', diachronically, use cutting-edge technology to 'gather-riches', by gaining military supremacy through their superior-quality weaponry. Mycenaeans exercised great influence in eastern-Mediterranean through overseas military raids against Anatolia and Egypt. By 1350/1320BCE, Mycenaean power progressively declined with evidence of increasing Palaces' destructions and a "LHIIIA2-LHIIIB Palaces' cardboard-collapse".

In this paper, a comparative analysis is presented, drawing from linguistics of personal-names and place-names in Linear B texts and Hittite and Egyptian records. The ultimate question to be addressed is, whether the recorded raids can be correlated with any destruction-layer(s) at Troy VI and, of course, whether one of these destruction-layer(s) might indeed reflect what became known as the Trojan War in ancient lore.

16 FROM DANDANKU TO CALCHAS: MILITARY RITUALS AS A CASE OF RELIGIOUS INTERACTION BETWEEN ANATOLIA AND GREECE

Author(s): Rutherford, Ian (University of Reading)

Presentation Format: Oral

Among mechanism for cultural diffusion in the ancient world one of the most regular must have been war. War forces people into close contact: think of the participants of the Battle of Qadesh. It also provides a motivation to keep up with the latest military technology (e.g. horse-drawn chariot warfare). In this paper I want to ask whether war could have been a context for the diffusion between Anatolia and Greece in the LBA. The possibility of this arises because there was probably significant military contact between Ahhiyawans and Hittites or W. Anatolians. I shall be focusing here on the diffusion of religious practice, particularly military rituals.

In most, if not all, ancient cultures (e.g. Mesopotamia, Hittite Anatolia, Israel, Greece, Rome) warfare was to some extent ritualised (see e.g. Beal.1995; Kelle, Ames and Wright.2014; Ulanowski.2016). Rituals take place at the start a campaign or a battle, at the end, and sometimes during the battle itself. The occurrence of similar rituals in neighbouring cultures may indicate borrowing, or long term areal diffusion, though it may also be that they developed independently.

In the paper I shall consider a number of Hittite battle rituals which have parallels in Greek sources of the 1st millennium BC. The most important of these is a class of W. Anatolian military plague rituals (e.g. Dandanku's ritual "if there is a lot of dying in the army"), which have similarities to the purification ritual performed by Calchas in Book 1 of the Iliad (Hazenbos.2007; Mouton and Rutherford.2013). I shall assess the significance of such parallels by putting them in the general context of Mediterranean and W. Asiatic military rituals.

46 CENTRAL MEDITERRANEAN PREHISTORY AT THE EAA25 TURN: RESEARCH ADVANCES AND NEW DIRECTIONS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Dolfini, Andrea (Newcastle University) - Robin, Guillaume (University of Edinburgh) - Tafuri, Mary Anne ('Sapienza' University of Rome) - Iacono, Francesco (University of Cambridge) - Gori, Maja (Ruhr-Universität Bochum)

Format: Regular session

The Central Mediterranean is one of the most intensively researched regions of prehistoric Europe in subjects including, but not limited to, landscape and environment, settlement patterns, exchange and mobility, technology and economy, life- and deathways, social complexity, and early urbanism. Recent discoveries and scientific analysis have furthered our understanding of its material and social dynamics, but debate is often hindered by hyper-specialisation as well as disciplinary and country boundaries discouraging comparative, cross-subject, and cross-period research. The session aims to take a 'critical snapshot' at prehistoric studies in the region since the time of the first EAA meeting. We will discuss key disciplinary developments occurred in the last 25 years and capture the most innovative present-day research advances, which may shape the agenda of Central Mediterranean prehistoric studies in the next 25 years.

We invite doctoral students, early career researchers, and established scholars to submit papers discussing recent advances and new directions in central Mediterranean prehistory from the Palaeolithic to the Iron Age. The region ranges from the Southern Alps to coastal Tunisia/Libya and from the eastern Adriatic/Ionian Seas to Sardinia, Corsica, and Provence. The papers should offer broad, bold, and conceptually engaging perspectives in any subject of prehistoric studies, focusing on how research has challenged established paradigms and interpretations, or how it is likely to challenge them in the future. Collaborative papers cutting across traditional geographic, methodological, and period boundaries are especially welcome, as are those showing how

the regional dynamics affected other areas of prehistoric Europe and the Mediterranean. A parallel poster session will host contributions with narrower period and area foci.

ABSTRACTS

1 PALAEO-LITHIC SHELL TOOLS AND COASTAL ADAPTATIONS: REVIEW AND PERSPECTIVES

Author(s): Romagnoli, Francesca (Universidad Autónoma de Madrid) - Campmas, Emilie (TRACES UMR 5608, Université Toulouse Jean-Jaurès)

Presentation Format: Oral

In the last decade shells as tools have been repeatedly identified in the archaeological record. Malacology assemblages were traditionally studied for paleoecology and for reconstruct dietary behaviours of past community. Technological approach and microscopic study for use-wear analysis showed that shells were used as raw material along Mediterranean coasts since Middle Palaeolithic. The understanding of the socio-economical value of these items and the study in evolutionary perspective analysing Neanderthal and Anatomically Modern Humans behaviours is a work-in-progress that has in-depth implications in the understanding of when coastal adaptations appeared. Furthermore, variations in coastal lifestyle allows addressing central topic in ancient Prehistory: dispersal routes, seasonal movements, and emergence of complex behaviours. However, several aspects are still few investigated. First of all a definition of 'coastal adaptation' is lacking; secondly, taphonomic bias is still few understood; and finally, a reliable chronological framework is needed. In this communication, we present the current knowledge of coastal occupation in Mediterranean regions along ancient Palaeolithic, especially focusing in subsistence and in the use of shell for functional aims in European Middle Palaeolithic and African Middle Stone Age. Furthermore, we discuss the implication of these data in the study of human evolution. Finally, we present perspectives of this research line according to recent studies that we are developing to solve some of the themes still pending of being investigated.

2 PREHISTORIC OBSIDIAN USE ON THE NORTHERN TYRRHENIAN ISLANDS, ITALY

Author(s): Tykot, Robert - Vianello, Andrea (University of South Florida)

Presentation Format: Oral

Obsidian formed during volcanic eruptions on several islands in the central Mediterranean and was acquired and distributed to small islands in the northern Tyrrhenian Sea starting in the Early Neolithic. While there are no archaeological remains of seafaring vessels for the Neolithic, it appears small islands were inserted in a complex exchange network as stepping stones along lengthy distribution and trade routes. Surveys and excavations have revealed obsidian artifacts on four islands: Pianosa, Giglio, Giannutri, and Capraia. Previous analyses on 14 artifacts from La Scola on Pianosa, and on 63 obsidian artifacts from Giglio indicated that three subsources in the Monte Arci complex of Sardinian were being utilized. A later study at the University of Calabria on 241 obsidian artifacts from Cala Giovanna and 28 from La Scola indicated the use of sources on Lipari and Palmarola, as well as Sardinia.

In this study, a non-destructive, portable X-ray fluorescence spectrometer was used to analyze trace elements on 118 artifacts from Capraia and Giannutri, and to retest 231 from Cala Giovanna. Results were calibrated using a widely-shared set of 40 obsidian standards, and assigned to sources and subsources by direct comparison with a large set of geological samples from the central Mediterranean sources analyzed with the same pXRF. These analyses verified the earlier studies and produce a combined dataset for all four islands.

As part of a large research project on Neolithic obsidian trade in the central Mediterranean, and compared with the representation of different sources and changes in their distribution over time, it has become possible to evaluate the dynamics of maritime exchange across the Tyrrhenian. Our study is uncovering increasingly sophisticated socioeconomic patterns in the Italian Neolithic. Areas previously considered marginal with remote geographic locations are revealed as deeply entangled to leading cultural and economic centers of the time.

3 NEO-LITHIC SUPPLY CHAINS AND DISTRIBUTION NETWORKS IN THE ADRIATIC BASIN – A SYSTEMIC APPROACH

Author(s): Della Casa, Philippe - Thöni, Ursina (University of Zurich)

Presentation Format: Oral

Recent advances in the study of Early Neolithic to Copper Age archaeological complexes in the Central Mediterranean, and in particular in the Adriatic Basin and the connected seascapes, has led to substantial reappraisals of their chronological frameworks and socio-economic interrelationships. Entities such as the Impresso Cardial Complex (ICC) and the complexes of polychrome pottery or incised and stamped pottery manifest as supra-regional phenomena that can be understood as networks of communication, often also taking the function of networks of raw material supply and distribution. Obsidian is an evident, albeit complex tracer of supra-regional networks, and so is flint, with the advantage that it is ubiquitous and multifunctional. The Gargano flint deposits and mines have been a focus of interest for many years, yet their importance as the major center of flint supply in southern Italy and the Adriatic basin in the Neolithic and Copper Age has only recently been recognized, thanks to the possibilities of tracing flint provenance and distribution by micro-facial analysis. Beyond the identification of sources and the mapping

of occurrences, a series of technological and socio-economical questions arise, relating e.g. to economic settings of production, flint working traditions and/or styles, and formats of distribution (blanks, tablettes, preforms). The long-term objective of such an approach is a systemic understanding of raw material circulation, to which we contribute elements of recent research on producer and consumer sites.

4 **COPPER METALLURGY IN CORSICA AND CIRCULATION NETWORKS BETWEEN THE ALPS AND SICILY**

Author(s): Pascal, Tramoni (Institut National de Recherches Archéologiques Préventives)

Presentation Format: Oral

Twenty-five years ago, the Corsican Neolithic chronocultural framework was still being developed. A multidisciplinary research about the island's megalithic tradition was then engaged and intended to give context to the various manifestations of the phenomenon, for which the cultural sequence of the Neolithic had to be fixed. In a first phase, between 5800 and 3400 BC, a clear cultural integration with neighbouring Sardinia is noted together with a clear pulse of influx from the south of the Tyrrhenian Sea. In a later phase, from 4000/3900 BC, the Corsican Recent Neolithic fragmented into various facies. It was on this cultural substrate that the Terrinian culture and the first copper metallurgy emerged.

Over the past decade, the rise of rescue archaeology has allowed a wider investigation of Terrinian settlement sites, resulting in new significant insights across various fields, from material productions to architectural forms, the organization and evolution of settlements, as well as economy and exploitation of natural resources.

Knowledge of cupriferous metallurgy has improved with new archaeological and archaeometric data. Although the precocity of metallurgy is still being discussed, a model of small interconnected local centres of metallurgical production can now be proposed.

Current data on the origin of technical transfers point to exchanges with the Alpine regions and Central Europe. Corsica would thus testify to an overall shift of spheres of influence and networks from south to north across the whole Neolithic. This new configuration continued until the beginning of the Middle Bronze age, when networks seem to rebalance in favour of multipolar exchanges.

With the sustained development of rescue archaeology, new data has been increasing, allowing both to sharpen micro-regional insights and to re-evaluate supra-regional matters. It is in this direction that archaeological research of the next decade in Corsica must be engaged.

5 **EARLY METALLURGICAL STUDIES IN THE CENTRAL MEDITERRANEAN: PAST, PRESENT AND FUTURE**

Author(s): Dolfini, Andrea (School of History, Classics and Archaeology) - Iaia, Cristiano (Newcastle University)

Presentation Format: Oral

The last 25 years has witnessed a surge of specialist interest in the archaeometallurgy of prehistoric Italy and Sardinia, with many new studies being presented, and new approaches debated, at EAA meetings (e.g. 2009, 2013 and 2017). As a result, the discipline has made a quantum leap in areas including chronology, technology, and the social context of early metal making and using. However, while answering longstanding questions, the recent research has also opened up new problems requiring integrated interdisciplinary approaches to be addressed. The paper offers a critical overview of the most salient advances in the study of early copper-alloy metallurgy in the central Mediterranean region since the early 2000s including the eastern Alps, the peninsula, and Sardinia; provides insights into as yet unpublished research carried out by the authors, focusing in particular on issues of metalwork chronology and provenance; and looks into the future of the discipline, highlighting research problems that need addressing urgently. It is argued that these problems can only be solved through a renewed dialogue between archaeologists and materials scientists.

6 **BUILDING UNDERGROUND: NEW APPROACH TO THE DEVELOPMENT OF ROCK-CUT TOMBS IN THE MEDITERRANEAN**

Author(s): Porqueddu, Marie-Elise - Bailly, Maxence (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence)

Presentation Format: Oral

The rock-cut tombs are underground architectures which were especially used in Mediterranean later prehistory. Present since the middle of the 5th millennium BC, they are more particularly developed during the second half of the 4th millennium and the first half of the 3rd millennium. The question of the origin and appearance of hypogea has long been the subject of an important debate proposing the development of this type of funerary architecture in connection with contacts from the Eastern Mediterranean, before focusing on the autochthonous origin of the hypogea in certain regions such as Sardinia. This problem is accompanied by important works on the chronology of hypogea. Difficult to address because of the absence of closed sets and their intensive reuse, the dating of hypogea was completely revised with the multiplication of radiocarbon datings from the 1970s (Whitehouse, 1972). This issue is still the subject of numerous articles thanks to the discovery of new burials and the renewal of data on the subject (Malone et al., 1995, Gonçalves, Andrade and Pereira, 2004, Valera, 2012, Negroni Catacchio et al., 2014, Tiberi and Dell'Anna, 2014). The purpose of this communication is to offer a new perspective on this debate using the study of know-how involved in the establishment and the digging of hypogea. The digging of prehistoric rock-cut tombs, subject of a thesis defended in 2018, requires a set of common knowledge to human groups practicing the exploitation of soils, both in the context of the implementation of funerary architectures and in the extraction of mineral resources. This study, through the prism

of know-how and no longer the architectural analysis alone, leads us to a new approach on the concept of technical environment developed by André Leroi-Gourhan.

7 PREHISTORIC ROCK-CUT TOMBS IN THEIR LANDSCAPE SETTING: RECENT FIELDWORK IN SARDINIA (ITALY)

Author(s): Robin, Guillaume (University of Edinburgh)

Presentation Format: Oral

The island of Sardinia presents one of the largest concentrations of prehistoric rock-cut tombs in the Central Mediterranean, with more than 3,500 monuments that were built and used between the Middle Neolithic to the Copper Age, some of them reused during the Middle Bronze Age. Locally known as 'domus de janas' (houses of the fairies), these tombs are known for their complex architecture combining multiple chambers, and their sculpted and painted decoration that referred to the interior of domestic structures (roof beams, doorways, pillars, bucrania, hearths).

Since the 1950s important research has been devoted to rock-cut tombs in Sardinia, focussing on survey, typo-chronological classifications, and the excavation of their content. However, the landscape context of the tombs, and in particular their spatial relationship with contemporary settlements, has been overlooked. This paper will present recent fieldwork research focussing on a group of rock-cut tomb cemeteries in Ossi (NW Sardinia), combining systematic fieldwalking with multi-scale 3D recording. Evidence of prehistoric settlements has been recovered and mapped out in order to explore their topographical relationships with the cemeteries, and how these relate to broader social questions of the status of the dead and their interactions with the living.

8 THE CETINA PHENOMENON BETWEEN THE LAND AND THE SEA. WHERE ARE WE NOW?

Author(s): Gori, Maja (Ruhr Universität Bochum) - Recchia, Giulia (Sapienza University of Rome)

Presentation Format: Oral

25 years ago ex-Yugoslavia was still in amid the war that ended with its dissolution. It goes without saying that archaeological research witnessed a break that lasted until the conflict was over and beyond –with relevant differences in each of the new-born countries. B. Govedarica's seminal work on the Early Bronze Age Cetina culture dates to 1989. By adopting a culture-historical approach he focussed mainly on its inland dimension. On the other hand, starting from the 1990s the overseas spread of Cetina features in the second half of the 3rd millennium BC caught the attention of scholars (Maran 1998; Cazzella 1999) whose research was however centred on regions outside its core area that is Dalmatia. From then onwards, alongside the flourishing of Mediterranean Archaeology as field of research (Broodbank 2013), the overseas dimension of Cetina has attracted increasing attention. It has indeed become clear that this wide circulation of models and objects resulted from a phenomenon of multiple long-range interactions.

In 2018 new research on Palagruža (Forenbaher 2018) shed light on different aspects of transadriatic connections. Yet, the inland dimension of Cetina remains somehow neglected. Can we understand the "international" Mediterranean dimension of the Cetina phenomenon without having a clear picture of the Cetina culture in its core?

9 MONUMENTS, FOLKLORE AND POLITICS: NOTES FROM A SMALL ISLAND ARCHIPELAGO

Author(s): Vella Gregory, Isabelle (University of Cambridge)

Presentation Format: Oral

The Maltese Islands never quite fit within an established paradigm. How does one tell the story of this archipelago? First, there are giants, whose impact goes beyond folklore. Second is a diffusionist paradigm that views people as passive receptors. Third, the emerging multi-strand narrative changed thinking in some areas but not made significant inroads in others. In particular, there remains reluctance towards a critical assessment of politics. The narrative and research are shaped by colonial and racial politics and an unresolved post-colonial period.

Tales of giants have led to an enduring focus on big stones, an idea that continues to underpin the tourism market. The folklore has not been studied in relation to archaeology, with the exception of Fr Magri's early in the 20th century, who sought to establish a Phoenician origin for the Maltese. Following the opening of the Suez canal, discourse shifted towards linking the islands with the African continent. This formed part of a wider Empire debate on the status of 'natives', with a focus on studying past and present skulls, attributing the Maltese to a "Mediterranean" race. These arguments need to be seen in tandem with the Islands' struggle for identity and political future, in particular an overarching Latin-Catholic identity, the Language Question (whether English or Italian should be the official language and the struggle for the recognition of the Maltese language) and the road towards self-government (granted in 1921 and revoked shortly thereafter). Post-Independence (1964) political turmoil led to the Faculty of Arts' removal from University. By the time it was re-established, archaeologists had to find new ways of approaching questions. There followed a time of intense work from the Italian and Anglo-Saxon traditions. Lingering old paradigms and approaches often collided. In the present, heritage is facing increased threats that are affecting research.

10 THE CONTRIBUTION OF SENSORY ARCHAEOLOGY TO CENTRAL MEDITERRANEAN PREHISTORY

Author(s): Skeates, Robin (Durham University)

Presentation Format: Oral

Sensory archaeology has now become an accepted part of archaeological method and theory, characterised by a well-grounded set of key concepts and debates and by a healthy diversity of perspectives. Bringing together the culturally diverse sensory assemblages and impacts of artefacts, human burials, buildings and landscapes, and their associated politics, a growing number of archaeological case studies has persuasively emphasised the remarkable variety of ways in which we make sense of the world around us, especially as members of societies and cultures with particular sensory orders and dynamics. Such studies have also reflected on our own particular ways of seeing and sensing, including the biases and misrepresentations of archaeological museums and heritage sites, which have tended until recently to deny all but the sense of sight.

This paper argues that, for Central Mediterranean prehistoric archaeology, there remains plenty of scope to put into practice new sensory studies: an undertaking whose apparently risky and experimental nature is mitigated by incorporating sensoriality into the full range of existing archaeological methods.

11 FOLLOWING PEOPLE BY FOLLOWING ROCKS: INTRA-ISLAND EXCHANGES AND MOBILITY IN PRE- AND PROTOHISTORIC CORSICA

Author(s): Leck, Arthur - Le Bourdonnec, François-Xavier (Institut de Recherches sur les Archéomatériaux - Centre de Recherche en Physique Appliquée à l'Archéologie - IRAMAT-CRP2A - Univ. Bordeaux Montaigne, CNRS : UMR5060)

Presentation Format: Oral

During pre- and protohistory, the first inhabitants of Corsica imported many lithic materials to make their tools, in particular obsidian and flint from Sardinia, two materials of good quality but absent from the Corsican landscape. These exogenous rocks have been at the heart of most of the typotechnological and provenance studies carried out on the lithic series unearthed in Corsica, highlighting the existence of long-distance diffusion networks. Endogenous rocks have also been used, notably rhyolite, a fine-grained siliceous volcanic rock widely distributed in Corsica, but they have received much less attention, notably due to a lack of methodological tools. Indeed, provenance studies of flint and obsidian have been carried out for several decades in many places in the world and multiple methodological developments have already been realized, which has not been the case for rhyolites. However, this material seems to have circulated at different levels within the island, from local to regional, and is thus potentially a carrier of information on mobility, exchange networks or territoriality, inaccessible from the study of exogenous materials.

After setting up an effective and non-destructive analytical protocol to determine the origin of Corsican rhyolites, mostly based on EDXRF method, we analysed several archaeological series, from the Early Neolithic to the Middle Bronze Age. Our results are still preliminary, and we will require analysis of other sites to obtain a more detailed view. However, these studies already allow us to get a first glimpse of unsuspected intra-island diffusion networks, to shed light on the relationships between coastal and mountain sites and to inform us of the ways in which these peoples used their environment.

12 LANDSCAPE, PLANT REMAINS AND ECOLOGICAL DATA IN PREHISTORIC SICILY: A DEBATE IN HUMAN-ENVIRONMENTAL SCIENCES

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Presentation Format: Oral

Sicily represents a crucial area in the Mediterranean basin for its geographic position, ecological diversity, cultural heritage, and historical richness. The comprehension of human communities' dynamics within their environmental context and their mutual connections is with no doubt one key approach for the development of archaeological studies in Sicily, through a real interdisciplinary and multiproxy research where anthropogenic and non-anthropogenic causes could be distinguished and analyzed.

Previous studies attempted to investigate the connection between environmental changes and social and cultural dynamics in prehistoric time in Sicily and the possible influence on other Mediterranean cultures (Izdebski et al. 2015; Martini et al. 2009; Mercuri et al. 2011; Pacciarelli et al. 2015; Sadori et al. 2016; Zanchetta et al. 2013).

The overall aim of this paper, through a comprehensive and multidisciplinary approach, is to review the paleoenvironmental and paleoclimatic results from lake sediments and the evidence from prehistoric contexts collecting archaeological (notably paleodemographic) and archaeobotanical (i.e. pollen and plant macro-remains) data in Sicily island. The paper will cover the chronological range from the late Pleistocene until the early historical times (~14000 – 2500 BP).

National and international researches have been carried out in the last decades on the island to collect data both from lacustrine pollen sequences and archaeological sites. All these studies allow to put together for the first time the paleoecological information and compare them with cultural development of prehistoric human groups to verify how climatic oscillations can have

affected prehistoric communities in settlement patterns, socio-economic changes, land use or other human activities.

13 INFERRING SOCIAL DYNAMICS OF ITALIAN COPPER AGE COMMUNITIES BY STABLE ISOTOPES ANALYSES: PRELIMINARY RESULTS FROM CENTRAL AND SOUTHERN ITALY

Author(s): Bernardini, Sara (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence, France; Dipartimento di Biologia Ambientale, Sapienza Università di Roma) - Coppa, Alfredo (Dipartimento di Biologia Ambientale, Sapienza Università di Roma) - Moggi-Cecchi, Jacopo (Dipartimento di Biologia, Università degli studi di Firenze) - Conati Barbaro, Cecilia (Dipartimento di Scienze dell'Antichità, Sapienza Università di Roma) - Goude, Gwenaëlle (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence) - Tafuri, Mary Anne (Dipartimento di Biologia Ambientale, Sapienza Università di Roma)

Presentation Format: Oral

The Copper Age in Italy (4000-2300 BCE) is represented mostly by funerary contexts, with many cultural practices still under debate. The funerary ritual is expressed by burials in artificial or natural hypogea, often used for collective burials over a long period, as witnessed by secondary depositions and radiocarbon dates. Grave goods are scarce if related to the number of inhumed, suggesting a specific socio-cultural relation within individuals of the same funerary structure, but our understanding of daily life is influenced by the ritual aspects of these contexts. Through stable carbon and nitrogen isotopes analysis on bone collagen of 81 humans from 6 necropolises of central and southern Italy we attempt a reconstruction of the dietary practices of Copper Age groups in the region, basing on the assumption that the acquisition, processing and consumption of the edible resources were strictly linked to community organisation.

Preliminary data show unexpected dietary similarities within categories that usually reflect socio-cultural distinctions, like the grave goods compositions. Otherwise, variations in the diet within the necropolises are related to the tomb of provenance and, to a lesser extent, to biological aspects (sex and age at death). The observed preservation of dietary habits over centuries, in necropolises of the same area, offer interesting insight into the structure of these communities, and their interaction with the territory.

Biomolecular studies suggest the correlation between supposedly independent aspects, such as dietary practices and the ritual world, and indicate to what extent they could address social issues, often barely discernible in prehistoric contexts.

14 INVESTIGATING THE INTERACTION BETWEEN HUMAN AND NATURE IN THE MALTESE ARCHIPELAGO DURING LATE PREHISTORY

Author(s): Recchia, Giulia (Sapienza University of Rome) - De Grossi Mazzorin, Jacopo - Fiorentino, Girolamo (University of Salento)

Presentation Format: Oral

The Maltese archipelago is a key-case study in Mediterranean Prehistory (and more generally in Mediterranean Archaeology). Since their first Neolithic occupation in the 5th millennium BC, Malta and Gozo have been fully included in the Mediterranean cultural scenario. Relationships with Sicily and maritime interconnections in general changed through time, with times of seclusion and periods of opening. Major archaeological questions are the environmental sustainability of these islands through time and to what extent Maltese prehistoric communities needed external contacts in order to obtain resources and raw materials. As focus of research the Temple period has attracted much attention, while other periods (especially the Bronze Age) have been somehow neglected till recent times. One of the most controversial points is the end of the Temple period and the transition to the Early Bronze Age. Was the exhaustion of environmental resources a cause for the collapse of the Temple culture? Or rather, were socio-ideological factors mainly responsible for this phenomenon? Was there a break in the occupation of the islands following the collapse of the Temple culture?

Recent research projects in the Maltese islands have sought to address these questions and more generally to advance the knowledge on the availability of environmental resources and specific economic choices made by the Maltese community during late Prehistory. Case studies, approaches and methodologies have differed, but this is beneficial for both the reconstruction of past socio-economic dynamics and the enhancement of the scholarly debate.

In this presentation we will give a synthetic overview of recent strategies of research and discuss fresh data from the long-life sanctuary of Tas-Silġ in Malta.

15 INTRASITE SPATIAL ANALYSIS: A BRANCHED PATH TO UNDERSTANDING SOCIAL PATTERNS OF BEHAVIOUR

Author(s): Lucci, Enrico (Dipartimento di Scienze dell'Antichità, Sapienza - Università di Roma)

Presentation Format: Oral

The relationship between spatial organization and social life is a meaningful scope of investigation for social science. Cross-influences between space organisation and cultural choices reflect a wide range of social behaviours; in this sense, considering the space in social theory we have a key feature to move from material culture to theoretical social models. Over the last few decades, spatial analysis has stepped-up our knowledge about settlements and communities of the 2nd millennium BC in Italy and the central Mediterranean. Analyses have been carried out on different kind of archaeological contexts, from those affected by sudden destructive events, falling into the "Pompeii premise" cases (Binford 1981), to those resulting from the progressive growth of refusal elements, apparently affected by a high degree of entropy. While the first yield significant information about

organization of the space, the latter reflect repeated activities performed in a given space. Therefore, different methodological approaches to distribution analysis, from simple graphical representation to geostatistical analysis, have prompted different interpretative models of the spatial organization and patterns of use. However, the vast majority of the studies have focused on well-preserved suddenly destroyed contexts close to the “Pompeii premise”.

This presentation seeks to give a critical review of the use of intra-site spatial analysis to understand social patterns of behaviour. Cases-study from Italy and the central Mediterranean, either characterized by sudden destructive events or progressive growth of refuse elements, will be specifically discussed. The significance and suitability of both types of contexts as pointers for socially accepted behavioural patterns will be also investigated. Furthermore, a focus will be addressed to the spatial analysis of botanical and faunal refuse, proxy data for a wide range of human activities of production and management of primary and secondary goods.

A. **LARGE GAME HUNTING STRATEGIES IN THE MIDDLE PALAEOLITHIC OF SOUTHERN FRANCE: CONTRIBUTION OF DENTAL CEMENTUM ANALYSIS AT CANALETTES AND LAZARET SITES**

Author(s): Roussel, Audrey (Université Côte d’Azur; CEPAM; Région Provence-Alpes-Côte d’Azur) - Gourichon, Lionel (Université Côte d’Azur, CNRS, CEPAM; CEPAM, CNRS) - Valensi, Patricia (Musée de Préhistoire de Turrette-Levens; CNRS, HHNP) - Brugal, Jean-Philip (Aix-Marseille Université; CNRS, LAMPEA)

Presentation Format: Poster

The present paper aims to approach the subsistence systems, mobility and settlement patterns of Neandertal or pre-Neandertal in Southern France, focusing on hunting strategies. Recent zooarchaeological studies undertaken on several French Middle Palaeolithic sites have questioned previous models implying opportunistic large game exploitation and highlighted more complex food procurement strategies (collective and specialized hunting, meat storage and deferred consumption, etc.). However, this topic research remains limited due to the small number of sites carefully studied as well as the scarcity of high-resolution data. In this perspective, we propose to assess two main parameters: the demographic composition of the hunted animal populations and the seasonality of their acquisition. Both are critical to address mobility and settlements patterns of human groups.

We present here the preliminary results of the analysis of two archaeological contexts from Southern France: the layer UA29 of Lazaret cave on the Mediterranean coast (MIS6, Nice, Alpes-Maritimes) and layer 4 of the rockshelter site of Les Canalettes located in the mid-altitude zone of Causse du Larzac (MIS5a, Aveyron). This study focused on dental remains of red deer, ibex and large bovine (bison/aurochs), is based on traditional methods of age and season at death estimation (i.e. tooth eruption and wear), as well as dental cementum increment analysis.

Issues about the methodological limitations encountered in this study, particularly related with tooth preservation (macro- and micro-taphonomy), will be discussed. They will contribute to improve and adapt the sampling and cementum analytical protocols which can be applied to other Middle Palaeolithic contexts. The preliminary results already allow us to explore hypotheses about the functions and seasonality of the occupations and to conduct future comparative studies on Neandertal subsistence behaviours.

55 **FORGOTTEN CASTLE LANDSCAPES: CONNECTING RESEARCH AND HERITAGE, MONUMENTS AND LANDSCAPES**

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Pluskowski, Aleks (Department of Archaeology, University of Reading) - García-Contreras Ruiz, Guillermo (Departamento de Historia Medieval y Ciencias y Técnicas Historiográficas, Universidad de Granada) - Alexander, Michelle (Department of Archaeology, University of York) - Banerjee, Rowena (Department of Archaeology, University of Reading) - García-García, Marcos (Departamento de Historia Medieval y Ciencias y Técnicas Historiográficas, Universidad de Granada)

Format: Regular session

The castles of Europe are dramatic and fundamental interfaces for public understandings of the past. They can be situated in striking landscapes, which may be designated as national parks or UNESCO geoparks. Whilst both castles and landscapes attract visitors, they often remain disconnected from each other in terms of scholarly and public understanding. Where these landscapes functioned at a crucial point in the process of state formation as frontiers – regions created by conquest which absorbed resident populations and supplemented them with migrants – castles were constructed to secure and manage them. The European heritage sector has promoted these monuments as tourist attractions in varying ways. Many function as public museums, others have passed into private ownership with obligations of retaining some public access. Other still have become hotels or residences, with varying levels of protection for the monument and buried archaeology. In Iberia, for example, the creation of Paradors remains one of the most effective government strategies for conserving these monuments and connecting heritage with local economic growth. However, a crucially important aspect of these sites remains largely neglected – their cultural landscapes. In the last two decades, landscape archaeology has reshaped our understanding of medieval communities, stressing the connection between places and their associated territories. This has barely been adopted by the European heritage sector. Where castles were utilised as tools of conquest and colonisation, the cultural landscape provides a fundamental lens on the impact of imposing a new regime and social norms on the broader population. The aim of this session is to explore how these key regional monuments can be reconnected with their cultural landscapes, from both research and heritage perspectives. Our hope

is to move beyond the 'historical routes' that connect major monuments and define European regional tourism to synchronise cutting-edge scholarship with public understanding.

ABSTRACTS

1 CASTLE LANDSCAPES: RECONNECTING SITES AT RISK

Author(s): Kerr, Sarah (Trinity College Dublin)

Presentation Format: Oral

Medieval castles and their landscapes are often studied in isolation, which contributes to separation - or unequal emphasis - when dealing with contemporary challenges, such as climate change.

This paper introduces a number of medieval castles in Ireland which are under threat from encroaching shorelines. Previous scholarship on climate change and castles has focused on material-specific studies, such as the effect of increased rainfall on stone weathering. However, their associated cultural landscapes, which can be defined as areas of cultural significance which are the product of both nature and human activity, have been omitted from the discussions.

This paper argues that both these elements of heritage must be explored together, as they contribute to local and national cultural identity formation, and this is all the more pressing in relation to sites at-risk. If these sites are lost to climate change, what impact does that have on identities?

This paper posits approaches to reconnecting castles and their cultural landscapes through the use of deep mapping. It will be argued that this approach is not only a useful interdisciplinary and holistic research tool but a method of allowing public 'access' digitally to sites no longer accessible physically.

2 NEW WAYS OF SEEING: THE LEGEND, LADY AND LANDSCAPE OF CAERNARFON CASTLE, GWYNEDD, WALES

Author(s): Swallow, Rachel (University of Chester)

Presentation Format: Oral

The UNESCO World Heritage Site of the late thirteenth-century-founded Caernarfon Castle and its associated townscape situated within the Anglo-Welsh frontier of Gwynedd, North Wales, has been the subject of detailed academic scrutiny for considerable time. However, research approaches—and thus the heritage interpretation and presentation of the castle—have been predominantly architectural, and largely limited to King Edward I's castle and its post-1283 townscape. Surprisingly little consideration has been given to the role of Queen Eleanor de Castile in the design of the castle, its accommodation, and its wider landscape. This paper presents a fresh interpretation based on a broader temporal and spatial research approach, which replaces the monument within its seemingly forgotten landscape.

Focussing on the Queen's Gate, this paper considers Caernarfon Castle's combination of architecture and elite designed/cultural landscape for the first time. This interdisciplinary study thus re-examines Caernarfon Castle in the light of tangible traces of pre-Edwardian elite landscape features and monuments, as well as the intangible memory represented in the legend of The Dream of Macsen Wledig, one of the medieval Welsh tales of the Mabinogion.

In reconnecting the castle with its landscape from both research and heritage perspectives, this paper concludes that Caernarfon Castle has likely been the victim of nineteenth-century gender ideology, which has informed the later interpretation and presentation of the fortification's architectural spatial arrangements. A close examination of Caernarfon's Castle's Queen's Gate and the archaeology of its landscape approach, in association with features highlighted in contemporary Romance tales, indicates that a persistent memory of intertwined male and female ancestry was deliberately expressed by both Edward and Eleanor in a tangible form, still discernible in the landscape today. This new way of seeing with cutting edge scholarship, thus has repercussions of how we might research, interpret and present thirteenth-/fourteenth-century castles nationally and internationally.

3 CASTLES AND LANDSCAPES IN THE NETHERLANDS: AN ARCHAEOLOGICAL MANAGEMENT PERSPECTIVE

Author(s): Schreurs, José - van Doesburg, Jan (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

The interrelation between castles and their surroundings can be understood from two perspectives. The landscape played a role in the siting, development and function of castles. On the other hand castles influenced the development of their surrounding landscapes leading in some cases to castle or elite landscapes.

In the Netherlands we have castle landscapes in different regions. These landscapes are dotted with castles and castle sites. In other areas castles are less dominant and played a minor role in development of their surroundings. But none the less they or their remains are important historic places. The focus was until recently on the castles themselves and not so much on their environment both in castle research as in heritage management. Many main castle islands and to a lesser degree baileys are listed as (archaeological) monuments. Elements such as gardens, parks, deer parks, ponds, farmsteads and the surrounding parcelling

systems are often not legally protected. These elements are under pressure. Space is scarce and therefore in high demand. The maintenance of castles and estates becomes more and more expensive. Owners often see sell of parts of their property as the solution. Castles that are connected with their environmental and original functional context are becoming rarer. The influence of castles on the new landscape developments is reduced to historical references. The castles themselves become tourist attractions and are used as venues for parties, wedding and fairs. There is also much interest in castles ruins and sites both from municipalities, private developers as the public. Many castle sites are redeveloped and castle ruins consolidated or in some cases castles rebuild.

Reconnecting castles with their cultural landscapes is not an issue in the Netherlands yet.

In the presentation we will address this topic from an cultural heritage management perspective on the basis of several examples.

4 **CULTURAL LANDSCAPE STUDIES IN RESEARCH AND DISSEMINATION. THE CASE OF THE VIKING AGE RING FORTRESS NONNEBAKKEN IN DENMARK**

Author(s): Runge, Mads (Odense City Museums)

Presentation Format: Oral

The Viking Age ring fortress Nonnebakken is placed in and primarily under a modern-day city and only visible for the trained eye. The fortress has been known from historical maps and excavations for centuries and recent investigations have proved that it's state of preservation in many ways is excellent. The new research results have been the starting point for a revitalization of Nonnebakken in research and dissemination.

One focus point is a series of new research activities in the form of excavations, natural sciences and non-destructive analysis. The fortress among others is part of a large research project analysing the cultural landscape perspective, e.g. of defence systems in the Viking Age. One of the major results in this perspective is a new view on the nearby and wider hinterland of the fortress. Important new knowledge is the status of the fortress as part of a geographically widespread system with a series of various components and the systems coverage of both land and water ways.

Another focus point is a new and better presentation and visualization of the fortress on site and a continues work for bringing the fortress to the mind of the locals in terms of ownership and proudness of the place associated with the Viking Age background. An important point here is the ambition to apply for status as World Heritage Site as part of a serial nomination.

A third focus point is dissemination of the fortress in its cultural landscape setting. Here three major events have been conducted. One was concerned with the signal lines, the beacons, of the Viking Age from the coast to Nonnebakken, another illustrated the importance of Viking Age ships and the last will focus on the archaeological elements in the nearby hinterland to Nonnebakken.

5 **BEHIND THE LOIRE VALLEY CASTLES CLICHÉS: THE ARCHAEOLOGICAL REALITY OF THE MEDIEVAL CASTLE OF GIEN (FRANCE)**

Author(s): Bizri, Melinda (UMR 6298 Artheis / University of Burgundy) - Labille, Magali (Department of Loiret) - Borderie, Quentin (UMR 7041 Arscan / University of Paris I -Nanterre)

Presentation Format: Oral

The medieval castle of Gien is a great well-conserved monument of the Loire Valley (France), but it reflects a paradox. This castle houses heritage collections of the National museum of hunting disconnected from the history of the place. Until recent archaeological researches, the context of edification of the castle and its medieval origins were unknown and dealt more with imagination than with scientific knowledge.

However, the chance of a refurbishing project (from 2011 to 2014) focused the reflection on the castle itself because of the repair of a lot of its building's materials. Archaeology studies of the site came through this project because the owner of the site - the Department of Loiret - has its own archeological service, able to handle this type of mission.

The results of such an archaeological support largely exceeded our expectations. The period from the 9th to the 11th century was excavated while only an occupation of the 13th-15th century was expected; new observations were made thanks to geoarchaeological and environmental studies.

This was allowed by discussing with the craftsmen working in architectural restoration and the decision-makers of heritage cultural policy, in order to minimize the impact of the transformations on the comprehension of the monument.

After the achievement of archaeological excavations and studies and after the end of the constructions works, different projects are still in progress. Some are addressed to a scientific audience but the promotion of this rich historical and archaeological context to the general public continue to be carried out: an exhibition of the archaeological work will be held in 2020 inside the museum. This kind of actions highlights the various and large possibilities of contributions that this kind of experience can create, by connecting people to their cultural heritage.

6 CASTLES WITHIN FORGOTTEN TOWNSCAPES: FORTIFIED MEDIEVAL TOWNS IN THEIR ENVIRONMENT IN EURE-ET-LOIR (FRANCE)

Author(s): Borderie, Quentin (CNRS - UMR 7041 ArScAn; Service de l'archéologie préventive d'Eure-et-Loir) - Lacroix, Thomas - Acheré, Vincent (Direction de l'archéologie - Chartres Métropole) - Bryant, Simon (Ministère de la culture) - Capron, François (Institut national de recherches archéologiques préventives) - Labat, Olivier (Service de l'archéologie préventive d'Eure-et-Loir) - Lelong, Alain (Les Amis de Bonneval) - Louis, Antoine (CNRS-l'ESR 3155 IRAA) - Pinède, Anaïs (CNRS - UMR 7041 ArScAn)

Presentation Format: Oral

Since the 12th c. in the north of France, castles are connected with fortified towns, which have a deep impact on the environment, especially in a fluvial context. If ruined castles are the focus of archaeological studies, people are more attracted by the monumental remains of the walls and their resilience in the town-plan. While rescue archaeology in small towns faces the lack of historical knowledge, local policies can make wide use of this heritage to attract tourists, which is important in the Eure-et-Loir, 40km from Paris. During the medieval period, this sector is influenced by the royal domain, the counties of Blois, Perche, Chartres, and the duchy of Normandy.

Although the town walls, doors and moats can still be noticeable in the actual landscape, these monumental remains are mostly ignored. No legal nor material protections are applied and urban development is a danger for the preservation of this heritage. Moreover, the knowledge of these towns has been neglected since the 1960s. Only Chartres (cathedral UNESCO) is the place of attention, but environmental data are still lacking.

The program "FortUM" is aimed to study these fortified towns in order to place them in their environment. The focus is on urban townscapeS and systemS, the link between town and country and the management of the hydrosystem. The good preservation of the town plan and poor urban development since the 19th c. allow us to get core data on urbanised rivers and to conduct geophysical survey of large sectors of towns. The first results have been acquired by the study of ancient maps, archives, and of excavation data. They show that a first network of fortified localities emerges in the 11th c. It can also be observed that a strong artificialisation of the hydrosystem has taken place since the 11th-12th century.

7 RETELLING THE STORY OF THE MEDIEVAL FRONTIER IN CENTRAL IBERIA: THE CULTURAL LANDSCAPE OF THE CASTLE OF MOLINA DE ARAGÓN

Author(s): Garcia-Contreras Ruiz, Guillermo (Universidad de Granada) - Pluskowski, Aleks G. (University of Reading) - Alexander, Michelle (University of York) - Banerjee, Rowena Y. (University of Reading) - García García, Marcos (University of York; Universidad de Granada)

Presentation Format: Oral

Molina de Aragón is famous for its dramatic castle, which began as a rural Berber fortification during the early Islamic period (8th–10th centuries), then developed into a focal point for the defence of Al-Andalus against the expansion of Christian kingdoms from the north (10th–11th century), and subsequently became the capital of the Taifa of Molina, following the collapse of the Umayyad Caliphate. In 1129, Molina was conquered by King Alfonso I of Aragon and subsequently bequeathed to the Lara family, who expanded the castle and maintained a virtually independent frontier lordship into the 14th century. As the Christian-Muslim frontier shifted south by the start of the 13th century, the territory of Molina came to border the lands of two opposing Christian powers to the north, east and south (Aragón) and west (Castile). Muslim communities in the territory of Molina gave way to those established by Christian and Jewish migrants, and all three groups were represented in the town of Molina.

For many centuries then, the castle at Molina functioned as the centre of governance of a multicultural frontier landscape. This landscape is dominated by one of the principal mountain regions in Spain, cut by the valley of the River Gallo in the Upper Tagus, and recently designated as a UNESCO Global Geopark in recognition of its distinctive natural heritage. However, the castle and the Geopark, as well as the broader historical frontier, are not readily connected by heritage managers or visitors. One of the main aims of the Landscapes of (Re)Conquest project is to change how we understand iconic castles such as Molina, establishing a methodological precedent for the future by connecting the story of the castle's development with the transformation of its cultural landscape, a story ultimately created by waves of Muslim, Christian and Jewish migrants.

8 SOIL MICROMORPHOLOGY AS A TOOL FOR CONNECTING THE BURIED ARCHAEOLOGY AND HERITAGE MANAGEMENT STRATEGIES IN CASTLE LANDSCAPES ACROSS EUROPE

Author(s): Banerjee, Rowena (University of Reading) - Huisman, Hans (Cultural Heritage Agency of the Netherlands; University of Groningen) - Nicosia, Cristiano (Università di Padova) - Borderie, Quentin (Département d'Eure-et-Loir, CNRS - UMR 7041 ArScAn) - Béguier, Irène (Park of Morbihan Gulf) - Colenburg, Jesper (Independent)

Presentation Format: Oral

Across Europe, only recently is the scientific potential of the buried archaeological deposits within castles being more widely realised, having often been overlooked in favour of the protection and consolidation of standing remains, developments such as reconstruction and rebuilding projects. Current frameworks for protection and research strategies vary greatly across Europe in relation to the significance that is ascribed to the archaeology of castle sites.

We present soil micromorphology results from castle sites in Britain (Scotland), Estonia, France, Italy, Latvia, Poland, Spain and The Netherlands, representing a diverse range of cultural and environmental contexts. Micromorphology can be used to refine

the stratigraphic sequence, to identify activities at high resolution from first construction phases or, in characterising the changing use and, following decay, the re-use occupation of structures. Detailed understanding of these phases and hiatuses in use is important for understanding the role of a castle in its wider landscape. Furthermore, micromorphology enables the examination of the differential preservation of plant remains and the identification of organic materials in a variety of forms, which are crucial components for understanding the diet, livestock management and economy within a castle and the exploitation of its hinterland.

We highlight the requirement for robust scientific analysis of buried stratigraphy if it is uncovered by building activities that include the conservation and renovation of the standing architecture and the removal of rubble, which can unseal buried archaeology and affect its preservation. Micromorphology data can be used to develop and drive pan-European heritage research and management strategies of buried archaeology at medieval castles and connect these sites with their landscapes.

A. THE CASTLE OF CERVELLÓ (BARCELONA) AND ITS IMMEDIATE LANDSCAPE. ACQUIRING INFORMATION TO BETTER APPRECIATE IT

Author(s): Pancorbo, Ainhoa (Freelance)

Presentation Format: Poster

The castle of Cervelló, whose first written reference dates back to the year 904, is placed on the top of a hill currently accessible from the road that leads to the upper urbanizations of the town. In the middle ages it could only be reached by a path from the side of the hill, where a big squared tower controlled a large landscape and watched the rest of constructions scattered on both sides of the path. Amongst them, there is a chapel, a cistern and vestiges of different other structures discovered under bushes and brambles. Some meters down from the castle we can also find a Romanesque church with a necropolis associated to it, composed by several anthropomorphic tombs. All these structures were used during a long period of time. The castle was seriously damaged in 1462 though all evidences show that it was rebuilt. But it definitely collapsed in the first quarter of the 18th century. Since 2010 the town council has made a great effort to highlight all these structures within its landscape as well as to make them accessible for all kinds of visitors. In this poster we try to explain both the structures that make up the castle, the church and the associated habitat, as well as their role in medieval times, and how the restoration works have reversed in a better knowledge of the whole ensemble.

57 FROM LOCAL TO GLOBAL. CURRENT PERSPECTIVES ON EDUCATION AND CULTURAL HERITAGE

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Farrujía de la Rosa, Jose (Universidad de La Laguna) - Hernández-Ojeda, María (Hunter College. City University of New York)

Format: Regular session

Cultural heritage can only function as a conduit of sustainable development through proper education, in order to raise awareness of its importance. But cultural heritage also has a dual character whereby it can, at the same time, be celebrated for its outstanding universal value while having a special meaning and value for local and, in particular, bearer communities.

This session aims to explore how to effectively teach local cultural heritage, mainly archaeological, to grade school, high school, and university students, within the existing framework of the respective Curriculums and degrees. Also, it aims to analyze the general structural inadequacies of the Education system that exist not only in Europe, but in other continents too, in order to consider how these greatly affect the teaching of the local cultural heritage.

Basing protection on the former notion of heritage as a universal, global value has been the dominant approach in international law-making since the second half of the twentieth century. More recently, the significance of heritage to local actors has become much better understood and recognised. This session would also examine the aforementioned shift from an emphasis on local to global heritage and the role education can play in this with regard to Curriculum and Pedagogy, lifelong learning, training programs, teaching and learning relationship, extra-curricular activities (such as those developed in museums), pedagogic innovations, and inclusive and special education.

ABSTRACTS

1 PROMOTING LOCAL HERITAGE USING THE CURRICULUM OF CHILEAN FORMAL EDUCATION-SYSTEM: POTENTIALS AND LIMITS OF A TRANSDISCIPLINARY DESIGN OF DIDACTIC UNITS

Author(s): Urrea-Navarrete, Josefina (Facultad de Ciencias Sociales, Universidad de Concepcion) - Salazar Sutil, Diego (Facultad de Ciencias Sociales, Universidad de Chile; Fondecyt 1151203) - Maldonado Elevancini, Cecilia (Facultad de Educación, Universidad de Concepcion) - Andrade Martínez, Pedro (Facultad de Ciencias, Universidad de Concepcion) - Muñoz Aranda, Mónica (Facultad de Educación, Universidad de Concepcion) - Escobar, Manuel - Vargas Neira, Karina - Torres Yañez, Romina (Investigadora Independiente)

Presentation Format: Oral

In this presentation we will show the main results of a co-design process and implementation of two didactic units that promote archaeology, history and local identities of Taltal, Antofagasta, Northern Chile. These units were created to be integrated accord-

ing to the requirements of the official Chilean national curriculum, using learning objectives of Language and Communication and Social Sciences, History and Geography subject of the First and Second Grades at the local primary school (6-8 years old).

The units were designed transdisciplinary with local teachers and a team of educators, graphic designers, anthropologists and archaeologists, aiming to combine academic with non-academic-local-traditional knowledge, all which are part of Taltal heritage. The didactic units were implemented on a total of twelve courses and 606 students, during one month, by local teachers and undergraduate students of pedagogy from our team, in all educational establishments in Taltal.

Moreover, we will discuss the recognition of the main obstacles and potential described by local teachers when they dealing with the teaching of local heritage to the students. Also, we will be focusing in the impact that these didactic units had on the different statements of the educational institutions of Taltal.

Finally, we hope to evidence some advantages and limitations that we faced during co-design and implementation process of this kind didactic units in the context of formal education of the Chilean System and Latin American.

2 HEGEMONIC CULTURES AND DOMINANT HERITAGES: THE ROLE OF THE INDIGENOUS CANARIAN CULTURE IN THE PRIMARY SCHOOL TEXTBOOKS

Author(s): Farrujia de la Rosa, Jose (Universidad de La Laguna) - Hernández-Ojeda, María (Hunter College - City University NY)
Presentation Format: Oral

The Imazighen from North Africa settled in the Canarian Archipelago in the middle of the 1st millennium BC and developed a culture on the islands that can be linked to native North African societies and magical-religious practices associated with the religions of the ancient Amazigh. This entire indigenous culture, which had existed in the Canary Islands, began to disappear irreversibly following the conquest and colonization of the Archipelago by the Europeans, which began in the Late Middle Ages.

Since then, all information about the indigenous world was clearly influenced by “western thought”. The colonial past has had a clear influence on the development and evolution of ethnography and archaeology in the world. This framework has, in turn, shaped archaeological heritage management, and consequently, the study of the interrelations between the colonial past and archaeological studies.

This paper analyses the case of the indigenous culture of the Canary Islands, and its role in the current primary school textbooks. Within the educational context, we analyse how heritage is portrayed in elementary school textbooks, comparing, for instance, the case of the namely European/monumental heritage (Castilian monuments and buildings) versus the African/non-monumental heritage (Amazigh or ancient Canarian sites).

This paper highlights the role played by colonialism in archaeological heritage management and education. Our research analyses the way in which monuments are preserved and understood by heritage professionals, teachers and the interested public. Finally, we describe the numerous contradictions concerning the nature, origin, and context of the indigenous peoples.

3 THE ARQUEOBORN PROGRAM, ONE TOOL FOR THE TRAINING OF ARCHAEOLOGY'S STUDENTS AT THE EL BORN ARCHAEOLOGICAL SITE IN BARCELONA

Author(s): Fernandez Espinosa, Antoni (El Born CCM. Ajuntament de Barcelona) - Miró, Carme (Servei d'Arqueologia de Barcelona. Institut de Cultura de Barcelona. Ajuntament de Barcelona) - Solé, Queralt (Universitat de Barcelona)
Presentation Format: Oral

The El Born CCM archaeological site in Barcelona (Cultural and Memorial Center) was discovered in 2001, when the Born building was being converted into a public library. El Born is formed of 8,000 sq. m. of an uninterrupted urban area, up of 63 houses along 9 streets, dated from the end of the 13th century to the year 1717.

Currently, more than 60% of the site of El Born remains as it was in the early 18th century, intact. Accordingly, we can view El Born as a living site that should still provide us with a wealth of information about how this neighborhood of Barcelona city evolved.

El Born CCM has promoted the ArqueoBorn program in order to vindicate and showcase the site's archaeological remains and, thus, give continuity to research through archaeological excavations with Archeology students in the University of Barcelona and professional archaeologists. These are compulsory practices where students learn to dig, draw and classify materials from medieval and post-medieval times. El Born collaborates with the University in the formation of students, through excavation and master classes.

In this paper we focus on the role of the formative archeologist, and we will explain the experience of the last four excavation campaigns.

4 TEACHING HERITAGE: PRESENTING PREHISTORY IN ENGLISH PRIMARY SCHOOLS

Author(s): Sharpe, Kate (Durham University)
Presentation Format: Oral

Once upon a time, the teaching of history in English primary schools began with the Roman Invasion in AD43. In 2013, however, a much-debated redesign saw the introduction of the Stone Age, Bronze Age and Iron Ages (the term 'prehistory' is not actually used) into the National Curriculum at Key Stage 2 (7-11 years). This presented a significant challenge to teachers, and not only because they were themselves unfamiliar with the period: this vast new topic spanned millennia and included complex and ab-

stract concepts which, for younger children, could be difficult to convey. Further, the lack of characters and of dramatic events and reliance on archaeological evidence meant that different approaches were needed. Five years on, how is the teaching of prehistory now going? The Ancient Identities Today project, at Durham University and Stirling University (funded by the Arts and Humanities Research Council) has been exploring aspects of 21st century engagement with Iron Age and Roman past. In this paper we present observations based on interviews with educators, and ethnographic fieldwork at open-air heritage venues. Heritage organisations, both public and private, have clearly responded to the need for improved access to information about prehistory. Local museums and open-air venues developed new resources and educational opportunities, and found an appreciative audience. Our research suggests, however, a number of issues with the current syllabus and the way in which the crucial interface between ‘prehistory’ and ‘history’ is presented. But how important is detail and accuracy at this level? Should Key Stage 2 History be simply about engagement and inspiration—about local connections and empathy—rather than evidence, context and critical thinking? Or can we aim for all of these?

5 THE HERITAGE BAG - AN EXERCISE FOR TEACHING AND LEARNING WITH A THEORETICAL APPROACH

Author(s): Synnestvedt, Anita (University of Gothenburg)

Presentation Format: Oral

Heritage is often associated with old buildings or objects in museums. The term has mostly been used, for example, to highlight a nation-building process in which each nation in each era decides what shall be classified as heritage and preserved for future generations. Some is chosen to be protected by law and looked after as a legacy for the future, while other things not chosen become invisible and lose value in contemporary society. Nevertheless, heritage is not just part of a nation-building process, it is also our own traditions, memories and experiences that we all carry within us. Heritage is nowadays discussed in terms of tangible heritage (buildings, objects, stationary ancient monuments), and intangible heritage (traditions, songs, skills in crafts, etc.). Heritage is also claimed to be in constant movement, that new heritage is frequently being created, and that it is a process that all humans participate in.

My questions in this presentation is how to use heritage in teaching and learning and why it is important doing so. I will introduce a model of four spheres, which I have named PWNW (Personal, Wider, Nation, World). The model presented has been developed through a pedagogical exercise called “the heritage bag” and it is a result of many lectures, presentations and performances during the last 10 years.

Through the model PWNW I claim that students, pupils and others participating in the Heritage bag exercise changes their perception of what heritage means. It has been proven to be an effective tool in teaching and learning about heritage in primary schools, high schools and universities as well as within informal learning situations.

6 WORLD CULTURAL HERITAGE IN AN OPEN LEARNING FRAMEWORK

Author(s): Thoeming, Alix (The University of Sydney)

Presentation Format: Oral

In 2018 the University of Sydney introduced Open Learning Environment (or OLE) units into degree programs across the university. These units were introduced and designed with the aim of diversifying the experience of the student cohort across the University, and the specific agenda delivered to individual departments was to present a topic which could be considered broadly relevant to an audience outside their discipline. Students are required to take between two and six of these almost entirely online OLE units, however, as they do not count towards a major, yet are mandatory for the satisfaction of degree requirements, it has generally been thought that unit selection would be informed either by the desire to learn a particular skill, or for pure interest. The Department of Archaeology decided upon cultural heritage, or more precisely the World Heritage List, as its departmental offering. In selecting this topic, it is hoped that students across the humanities in diverse majors and degree programs will see an area in which they can both make use of their own expertise and extend their learning experience. The unit interrogates UNESCO’s Outstanding Universal Value criteria, explores the legal frameworks on which the World Heritage Convention is built, and encourages students to consider the impact of politics and process on sites inscribed upon the World Heritage List. This paper will provide an overview of the unit, including demographic information about the students who chose to add it to their programs, and both a pedagogical and heritage-focussed reflection on the experience.

60 BEYOND “FOUNDER CROPS”: NEW INSIGHTS INTO UNDERSTUDIED FOOD PLANT RESOURCES

Theme: Archaeological theory and methods beyond paradigms

Organisers: Caracuta, Valentina (Institut de Science de l’Écologie de Montpellier) - Antolin, Ferran (Integrative Prähistorische und Naturwissenschaftliche Archäologie - IPNA, University of Bern)

Format: Regular session

The beginning of agriculture is seen as the major transition in the human past, a changeover that strengthened sedentary life-style, drastically reduced the risk of famine and the dependence on the environmental conditions, and ultimately, allowed the human population to prosper.

Archaeological and genetic discoveries have shed light on the most relevant processes that accompanied the domestication of the so-called “founder crops” (emmer, einkorn, barley, lentil, pea, chickpea, bitter vetch and flax). Nevertheless, the role of minor

crops and weedy plants, as well as wild plants that could have been cultivated but eventually not domesticated, among hunter-gatherers and early farmers is relatively understudied. With the increasing corpus of archaeobotanical data, together with the appearance of new and more powerful genomic, biometric and radiocarbon dating techniques, we are gaining new insights into plant cultivation and domestication that had not been possible before.

Within the framework of this session we would like to bring together researchers working on the cultivation of wild plants and the domestication of minor crops in Southwestern Asia, Northern Africa and Europe. We also encourage new archaeobotanical and paleogenomic discoveries to be presented, to track and date changes in the phenotypes and genotypes of plants that are considered marginal, but were instead crucial for the survival of ancient and modern-primitive communities.

Papers that discuss the mechanism of exploitation of minor crops among modern traditional societies from an ethnographic perspective are considered relevant to the discussion.

ABSTRACTS

1 RE-DEFINING THE “FOUNDER PLANTS” IN SOUTHWEST ASIA

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

Presentation Format: Oral

Plant-foods make up the bulk of the diet in many hunting and gathering, agricultural and pastoral societies across the globe and they comprise a wide range of resources such as seeds, tubers, fruits, nuts, leaves, stems, and flowers among others. However, some plant resources have been studied far more exhaustively than others. In southwest Asia the research has primarily been focused on the origins of agriculture and the domestication of the eight Neolithic founder crops. In this paper we review the archaeobotanical evidence gathered in the last years, and show that the so-called “Neolithic founder crops” do not necessarily represent the plants that sustained the economy of early Neolithic communities, nor were species conspicuously exploited by preceding foragers. We argue that modern perspectives on human diet, agriculture and food production have tainted our understanding of the past plant-based subsistence, emphasizing the importance of grain/seed consumption of specific cereals and pulses and underestimating the exploitation of other edible plant resources. Thus, the evidence highlights the need to redefine the plant species to be considered as “founders”.

2 LOST IN THE MISTS OF TIME - FABA BEAN (*VICIA FABA*) AN OVERLOOKED FOUNDER CROP

Author(s): Caracuta, Valentina (Institut des Science de l'Écologie de Montpellier)

Presentation Format: Oral

The transition to farming was a vital step in establishing modern societies. A critical component of this step was the cultivation of food plants, which led to a sharp increase in the successful subsistence of sedentary populations. At the foundation of the sedentary societies' structure were critical food crops; the earliest of these are called 'founder crops' due to the essential status they had in the diet as hunter-gatherers transitioned to an agrarian society.

Faba bean, as a protein-rich food, might have served as a valuable meat substitute for early farmers as they transitioned from hunting large game to agrarian sustenance, but it has never been included among the founder crops.

Until recently, the original area of distribution of the legume was unknown and the legume went unnoticed.

New discoveries in Southern Levant proved the pivotal role of the plant among the earliest farmers of the region and solved the enigma of the faba bean's origins.

The present study is based on the survey of the findings of faba bean in archaeological sites, where the seeds can be preserved for thousands of years, and aims to identify the original distribution of the wild progenitor of faba bean and the routes used by prehistoric farmers to spread the domesticated types across the Mediterranean.

The data collected show that the wild progenitor grew on Mount Carmel (Israel) about 14,000 years ago and that the earliest domesticated types were cultivated in Lower Galilee (Israel) around 10,200 years ago. From this point onward, remains of faba bean started appearing in the Middle East, then in the Mediterranean, and later, in central Europe, following the dispersal routes of the Neolithic farmers.

3 GROWING EAST ASIAN MILLETS: EXPERIMENTAL AND MORPHOLOGICAL STUDIES ON FOXTAIL MILLET (*SETARIA ITALICA*) AND RELATED WEEDY TAXA

Author(s): Lee, Gyoung-Ah - Vaughn, Maria - Kneisly, Angelica (University of Oregon)

Presentation Format: Oral

Millet is a vernacular name given to various small-grain crops with wide geographic origins. Among them, two northeast Asian varieties, foxtail (*Setaria italica* ssp. *italica*) and broomcorn or proso millets (*Panicum miliaceum*), are a few of the earliest staples, dating back to the Early Holocene. Initially being domesticated by ~9000 cal. BP along the Hwanghe (Yellow) River, they spread westward to Europe by 3500 cal. BP, and eastward to Korea by 7500–7000 cal. BP, and to Japan by ~5000 BP. Archaeological works on millets have mostly focused on when and where the earliest evidence appeared or the impact of millet farming to a rising social complexity. We intend to turn an attention to an agro-ecological aspect of ruderal taxa, leading evidence for appre-

hending the traditional farming methods and its impact on local vegetation. Our approach is twofold: to implement an experiment of growing heirloom varieties of foxtail millet in a greenhouse; and to document various morphologies of charred seeds that are identified to Panicoid (subfamily Panicoideae). By limiting any artificial aid to growing conditions in a minimum level, we attempt to replicate prehistoric cultivation conditions and to observe the growth of foxtail millet. A diversity of shapes and sizes of Panicoid seeds often adds a difficulty to identify them to a species level in archaeological assemblages. Even with an entire plant specimen, the species-level identification of these taxa is known to be demanding, due to their frequent interbreeding within the same genus and a high plasticity of their phenotypes. This study will document phenotypes of Panicoid seed remains from the Yiluo Region of China and compare them to our harvests from the greenhouse to develop a sensible qualitative and quantitative criteria for classification of various ancient millet-related remains.

4 OLIVE AND GRAPE IN PREHISTORIC AEGEAN: RESEATING THE RESEARCH AGENDA

Author(s): Margaritis, Evi (The Cyprus Institute) - Pagnoux, Clemence (LIRA Laboratory, Department of Archaeology, University of Thessaloniki)

Presentation Format: Oral

The timeframe of the initial intensive cultivation of both grapes and olives in Europe is a cornerstone of a long standing debate. It is suggested in the 'Mediterranean polyculture' hypothesis (Barrett & Halstead 2004; Renfrew 2011 for extensive discussion) that Neolithic subsistence agriculture was based on the cultivation of cereals and pulses, and the use of livestock. In the 3rd millennium BC, however, the systematic exploitation of the olive and the vine transformed traditional Neolithic subsistence: the new species could be grown on marginal land, where even poor, previously uncultivated soils could now be exploited. This development could be characterised as a separate agricultural revolution in southern Europe; the cultivation of the vine and the olive led to the production of a surplus, and their secondary products, wine and olive oil, were transformed into valuable commodities, retaining their central place in the economy of European societies until today. These transformations were correlated with population growth and with changes in technology and exchange patterns. For Renfrew and others (Renfrew 2011 for a review), the olive and vine therefore played a fundamental role in the creation of the conditions for the emergence of the first state-level complex societies of Europe, the palaces of the Minoan and Mycenaean societies of the 2nd millennium BC. Other researchers (Hamilakis 1996 for a review), however, suggest that these very important economic and social developments did not start during the 3rd millennium but, instead, they took place at least a millennium later. This debate is still ongoing in European prehistory because of the paucity of the archaeological, and in particular the archaeobotanical, evidence. This paper will examine the role of the olive and grape in Prehistoric Aegean through the analysis of archaeobotanical remains, morphometric analysis and material culture.

5 OIL AND FIBRE PLANTS DURING THE NEOLITHIC PERIOD IN THE NORTHWEST MEDITERRANEAN REGION AND NORTH OF ALPS

Author(s): Jesus, Ana (Universität Basel; Integrative Prehistory and Archaeological Science - IPAS) - Antolín, Ferran (Universität Basel; Integrative Prehistory and Archaeological Science - IPAS) - Bouby, Laurent (University of Montpellier)

Presentation Format: Oral

Most oil and fibre plants receive less attention from archaeobotanists than cereals and pulses, with the exception of flaxseed (*Linum usitatissimum*). Among the fibre plants used in Prehistory one should include the nettle (*Urtica dioica*). Regarding oil plants, there is evidence of poppy (*Papaver somniferum*), false flax (*Camelina sativa*) and also non-domesticated species such as turnip (*Brassica rapa*), woolly distaff thistle (*Carthamus lanatus*) and milk thistle (*Silybum marianum*). All of these plants rarely appear in discussions on Prehistoric plant use, even though they are present in the taxa lists of some archaeobotanically investigated sites.

For each of the species we will discuss which criteria, if any, are used to distinguish the wild form from the domestic plant, we will reflect on their potential as cultivated plants, and we will focus on their use and how we can assess it in the prehistoric record. Given the limited archaeological evidence available, we will review ethnographic records. Finally, we will look at their presence in the archaeobotanical record in Neolithic Europe, focussing on the North-west Mediterranean area and the North Alps, based on the archaeobotanical data (seed and fruit) compilation done within the SNF-Funded AgriChange Project (PPOOP1_170515). We will also discuss their absence in the archaeobotanical record as a result of taxonomic and sampling problems.

The aim of this presentation is to challenge the audience's conception of agricultural diversity and wild plant use among early farmers in the Neolithic period, integrating a set of plants that cover essential human needs but are rarely included in large reviews.

6 OAT DOMESTICATION: ARCHAEOBOTANICAL EVIDENCE FROM PREHISTORIC EUROPE

Author(s): McClatchie, Meriel (University College Dublin) - Murphy, Charlene - Fuller, Dorian (University College London)

Presentation Format: Oral

Common oat belongs to the *Avena* genus, which comprises around 25 annual species. Several species of oat have been domesticated, but only one species – *Avena sativa*, common oat – has prevailed as an important cereal. Before domestication, wild oats were gathered and used in several regions. Pre-domestication cultivation of oat has been recorded at several sites, including Palaeolithic Gilgal, Israel, while grinding tools in Palaeolithic Israel and Italy have produced evidence for starch grains of wild oat on

their surfaces, suggesting the tools were used to create oat flour. Domestication of cereals such as wheat and barley occurred during the Neolithic period, but domestication of common oat occurred much later, probably in later prehistory. Resolution of the timing and location(s) of oat domestication has proved rather challenging, but it is suspected that oat was domesticated in Europe. This paper will examine archaeobotanical evidence for the domestication and spread of oat in Europe, focusing on spatial, temporal and grain-measurement data.

7 CRAB APPLE IN PREHISTORIC EUROPE: FROM THE NEOLITHIC “GOLDEN AGE” UNTIL THE ARRIVAL OF THE DOMESTICATED FORM

Author(s): Antolin, Ferran (Integrative Prehistory and Archaeological Science) - Brinkkemper, Otto (Cultural Heritage Agency of the Netherlands) - Kirleis, Wiebke (Kiel University) - Pelling, Ruth (Historic England)

Presentation Format: Oral

Evidence for the presence of apple (*Malus* sp.) in Prehistoric Europe is archaeobotanically detected since the Mesolithic period. In a recent review of the data we observed that Neolithic finds increase radically while they drop again in the Bronze and Iron Ages, finally increasing again afterwards, with the arrival of the domesticated species. Is this truly so in different regions of Europe? And what does it mean from an economic point of view? Was crab apple fostered and managed in the Neolithic period and largely abandoned (or kept at a smaller scale) afterwards?

In order to go deeper into this discussion we will present an overview of apple finds in different regions of Europe where evidence is found over long chronological sequences and jointly discuss both taphonomic aspects (including methodological biases) as well as palaeoeconomic implications of the data. Our results will also be compared to current observations on crab apple productivity.

8 INTRODUCTION AND DISTRIBUTION OF CULTIVATED AND WILD PLANTS IN EUROPE FROM 8000 – 800 BCE BASED ON LINGUISTICS AND ARCHAEOBOTANY

Author(s): van Amerongen, Yvonne (Leiden University Centre for Linguistics; Archol - Archaeological Research Leiden) - Kroonen, Guus (Leiden University Centre for Linguistics; Department of Nordic Studies and Linguistics, University of Copenhagen)

Presentation Format: Oral

Europe has been populated by different groups of people since the Upper Palaeolithic, presumably starting with a hunter-gatherer lifestyle. At ca. 8000 BCE, the agricultural spread from Anatolia into Europe has provoked many changes in subsistence, interaction and diet: the so-called Neolithic Revolution. At ca. 3500 BCE, a new wave of people and innovations entered Europe from the east, introducing pastoral nomadism, new plant and animal species, and a language that can be reconstructed based on historical-comparative linguistics (i.e. Proto-Indo-European).

The arrival of new people among the existing (cultural) groups of Europe was profound and impacted all areas of prehistoric life. Dating these changes requires analysis of the evidence from comparative historical linguistics combined with archaeology.

With this paper we want to introduce and discuss historical linguistics as a tool in combination with palaeoethnobotany to create a more complete and detailed understanding of mobility, subsistence, and diet in the past. We will show sequences of maps, based on hundreds of archaeological sites, that follow the distribution of cultivated and wild plants throughout European prehistory, as well as their names within the different language groups. Furthermore, specific plant taxa will be highlighted in relation to the subsistence of hunter-gatherers, farmers, and pastoral nomads to identify their use by these groups.

The discussed data will form the basis for a future international online database that can be used to create overviews of the distribution of plants, animals, people, and language throughout European prehistory.

66 PROFESSIONAL COMMUNICATION OF ARCHAEOLOGICAL RESEARCH - TRAININGS AND OWNED MEDIA

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Veranic, Dejan (UNESCO kolišča na Igu, JZ Krajinski park Ljubljansko barje) - Dworsky, Cyril (UNESCO Welterbe “Prähistorische Pfahlbauten um die Alpen” in Österreich, Kuratorium Pfahlbauten)

Format: Workshop

No epoch has ever been so determined by the exchange of information as the century we live in today. The easiest way to grasp the continuous flow of data and opinions is the Internet. It is omnipresent and characterizes our work and everyday life. There can be no doubt: communication is the key to our modern society.

Nevertheless, training in professional communication is rare in the archaeological community and certainly not part of the normal curriculum.

In the workshop we will talk about the process of external information transfer in the context of archaeological projects and small institutions. We will discuss target groups and news factors. Furthermore we will explore the possibilities that owned media provide for the communication of our archaeological work, like websites, Facebook and Twitter accounts. We are also going to look into feedback analysis to improve the impact of our message. We will discuss the need for more communication training for archaeologists and how this could be accomplished. Contributions should be in form of impulse presentations 10 minutes each. In an atmosphere of open dialogue, there will be plenty of opportunity for mutual exchange and questions.

1 PUBLIC RELATIONS AND COMMUNICATION STRATEGIES ON PREHISTORY IN THE (POST) NAZI ERA**Author(s):** Groemer, Karina (Natural History Museum Vienna) - Loew, Carmen (Kuratorium Pfahlbauten)**Presentation Format:** Oral

Science communication and public relations are decisive for the way in which archeology - in this case research on prehistory and early history - is perceived in public. In recent years, more and more archaeological content is presented in the media, especially in social networks. Initially, however, less archaeologists than rather those people who are skeptical about them: probe walkers, treasure hunters, local researchers reach with their followers on YouTube and Twitter ever larger audiences and shape more and more the image that the public has of archeology.

It is only with hesitation that archaeologists themselves started to use these channels and thus also the almost limitless possibilities of communicating with the public independently and without mediation by journalists. As a result, however, the private "competitors" do not necessarily lose in popularity, because the general public seems to have a hard time dealing with the common communication style of our scientific field.

This style of communication, especially performed by scientists from Austria and Germany, which is very limited to the "brittle technical", is rooted in the history of archeology and its public relations work, especially during the NS regime. The lecture uses the example of museum dissemination to show how archaeology and its scientific results were communicated in the period between 1938 and 1945 and what messages were sent with it. There has been an over-use and mis-use of archaeology for ideological and propaganda issues (NS racial fanaticism; "Arian" master race) – even war and occupations (e.g. in Poland) have been justified and disseminated using archaeological traces. This did not remain without consequences for science communication of prehistory and early history and affected them well beyond the post-war period until the end of the 20th century.

2 TWO YEARS OF EXPERIENCE IN PROMOTING ARCHAEOLOGICAL EXCAVATIONS TO THE PUBLIC IN LJUBLJANA**Author(s):** Fras, Mojca (Skupina Stik; Archaeological Research Consortium for Ljubljana)**Presentation Format:** Oral

In the last years, as the result of fast urban development, the capital city of Slovenia is flooded by many building projects in the city centre. Due to ample renovations in the area abundant in archaeology, excavations are necessary. With ongoing research on many streets and squares of Ljubljana, archaeologists got the unique opportunity of presenting the national heritage to the public and opened a possibility for frequent relaying of detailed information about our shared past. Engaging the public in archaeological excavation could lead to a more effective long term heritage preservation. Since 2017, the priorities are focused on the professional performance of field work, post-excavation analyses and documentation, and building comprehensive PR campaigns and public engagement. We brought back into use - at that time unfunctional - the web portal (Ne)odkrita arheologija Ljubljane ((Un)covered Archaeology of Ljubljana). The portal and its name became synonymous for shared PR platform for Archaeological Research Consortium for Ljubljana, the contractor of archaeological excavations in Ljubljana and the City Museum of Ljubljana, the coordinator of the projects. We create and develop the most diverse material on all the projects and leading media campaigns. One of our main programs is led via social media and website. We are organizing free of charge professional public guided tours on different sites, curating different photo exhibitions connected with current archaeological projects and exhibitions of the most interesting artefacts in the City Museum of Ljubljana. Last but not least, we are presenting the results of archaeological excavations and their public outreach in Ljubljana at many lectures for professional and non-professional audiences.

3 PROFESSIONAL VISUAL COMMUNICATION FOR ARCHAEOLOGISTS**Author(s):** Lengyel, Dominik (BTU Cottbus-Senftenberg) - Toulouse, Catherine (Lengyel Toulouse Architects)**Presentation Format:** Oral

Communication in scientific communities rely on a set of standardized arguments and methods. The predominant method is verbal argumentation and citation, whilst verbal language itself is based on a strong level of abstraction. The term window prompts a large set of associations. Visual communication allows a further specification of the intended association. With a combined set of verbal and visual exchange of information, the communication meets the habits of our century. Especially the Internet demonstrates and depends on the dominance of a combined flow of verbal and particularly visual data. Furthermore, as visual communication is capable of concentrating verbal explanations into one single image – that is perceptible in a blink of an eye – the process of information transfer towards two target groups – archaeologist and the greater audience – can enhance substantially. Training communication therefore also consists of a weighting of verbal and visual content. As visual communication as such has always been part of archaeological communication, the purpose of this examination is to show how training in professional communication should include scientifically reliable visual communication, that is three-dimensional visualisations of spatial hypotheses. They cannot efficiently be accomplished by site measurement drawings or sketches, both being parts of the classical curriculum. There is not yet a standard that is able to compete with these traditional methods. A reasonable approach to standardize literal translations of verbal to visual argumentation could accomplish this.

The presentation illustrates this approach by projects developed by the authors in their University Chair and their architectural

office in cooperation with archaeological research institutions like Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral), The Metropolis of Pergamon (within the DFG Excellence Cluster TOPOI) and The Palatine Palaces (by order of the German Archaeological Institute, both exhibited in the Pergamon Museum Berlin).

4 ONLINE COMMUNICATION AROUND UNESCO PILE DWELLINGS IN AUSTRIA

Author(s): Dworsky, Cyril - Löw, Carmen (Kuratorium Pfahlbauten)

Presentation Format: Oral

In Vienna, the Kuratorium Pfahlbauten is responsible for the Austrian part of the transnational UNESCO World Heritage of pre-historic pile dwellings around the Alps. Considering that participation of the civic society is an integral part of the UNESCO World Heritage Program, science engagement and science mediation play a special role among the tasks of the Kuratorium Pfahlbauten. The Kuratorium has been managing a Facebook account since 2012 and has been running its own weblog, the Pfahlbauten-Blog, since 2015. For both channels, communication rules have been established, which in some cases differ significantly from the usual way of communicating in the archaeological field. Traffic and target groups, which can be easily identified for both channels, as well as the results of an international competition of science blogs, allow a data-based assessment and evaluation of the benefits of online communication for the public relations of the UNESCO pile dwellings in Austria.

5 AN ARCHAEOLOGIST'S JOURNEY FROM GUERRILLA TACTICS TOWARDS STANDARDIZED COMMUNICATION PRACTICES

Author(s): Veranic, Dejan (Krajinski park Ljubljansko barje)

Presentation Format: Oral

Many of us share our results, comprehensions or report ones of our colleges. We improve archaeological site visibility in order to add to its value and consequentially protection. Our efforts come in various forms such as posts, articles, reports, interviews or other. However, it is often the case that with often limited resources our message doesn't receive the visibility that we are hoping for.

To showcase the situation described above and possible paths for improvement, an experiment will be conducted and its results presented in the session. The experiment objective is to test various owned media that have the best engagement results for different target groups. The process will begin with revising current communication strategy for the test archaeological site, towards to processes and methods commonly used by communication specialists. That entails developing a communication strategy applied to predominantly digital media, required new skillsets, metadata analysis, feedback analysis that will help revise the message impact. Special attention will be dedicated to content creation and its application for different media and target groups.

68 15 YEARS AFTER MERRIMAN - PUBLIC ARCHAEOLOGY: LOOKING BACK AND THINKING ABOUT THE FUTURE

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Oldham, Mark (Norwegian Institute for Cultural Heritage Research) - Nienhaus, Luisa (University College London)

Format: Discussion session

In 2019, fifteen years have passed since the publication of the edited volume "Public Archaeology" (Merriman 2004), which was inspired by a WAC session organised by Nick Merriman and Tim Schadla-Hall in 1999. This session aims to evaluate how the discipline of public archaeology has evolved and changed over time and to establish whether the concepts discussed in the book are still relevant in a much-changed world. We also want to look ahead and build upon the work and ideas put forward in "Public Archaeology" by thinking about future directions and challenges.

We therefore seek both papers that offer a retrospective on this important early publication and papers which take the baton from Merriman et al and look towards the next fifteen years of public archaeology.

We are particularly interested in papers that explore one or more of the following topics:

- Commemoration and identity
- Archaeology and political engagement
- Communicating archaeology
- Archaeology 'of the public'
- Professionalisation and voluntarism in archaeology

ABSTRACTS

1 PUBLIC ARCHAEOLOGY AND ITS PLACE IN THE WORLD

Author(s): Oldham, Mark (NIKU - Norwegian Institute for Cultural Heritage Research) - Nienhaus, Luisa (University College London)

Presentation Format: Oral

In this introduction, we aim to set the scene and place the session and its papers in the context of both the session's key text,

Public Archaeology (ed. Nick Merriman), and wider developments in the field since its publication in 2004.

Merriman defines public archaeology as the study of processes and outcomes through which archaeology becomes part of a wider public culture. Since there is not a single public entity, public archaeology exists in the realm of contestation. Matters of ethics and identity are at its core, attributes which continue to be fundamental to the discipline and which are evident from this session's papers.

As we will hear, public archaeology is more than outreach and dissemination: it is a participatory discipline for the 'active citizen'. Access to information, knowledge and education along with technological advances, continue to make the world of archaeology accessible to the public. While participation is at the heart of public archaeology, tensions between 'mental' and 'physical' involvement in archaeology, as well as the relationship between the academic 'expert' and the layperson, not to mention relations between indigenous and majority populations.

2 **FORMAL EDUCATION AND ARCHAEOLOGY: A CRITICAL "PUBLIC ARCHAEOLOGY" 25 YEARS AFTER MERRIMAN AND 50 YEARS AFTER LATINAMERICAN SOCIAL ARCHAEOLOGY**

Author(s): Salazar, Diego (Proyecto Fondecyt 1151203; Departamento de Antropología, Universidad de Chile) - Urrea-Navarrete, Josefina (Facultad de Ciencias Sociales, Universidad de Concepción) - Escobar, Manuel (Independent Researcher) - Andrade, Pedro (Facultad de Ciencias Sociales, Universidad de Concepción)

Presentation Format: Oral

In this paper focus on what we consider some of the main contributions posed by Merriman's seminal edited volume Public Archaeology (2004), as well as of the work of some of the Latinamerican Social Archaeologists (LSA) of the 1970's and 1980's. We will discuss the posterior developments of these main contributions during the last decades, as well as its main limitations and failures.

We will also present our own experience with a project of public education and archaeology in the Comuna de Taltal, in the hyperarid coast of northern Chile. We will discuss how this work builds on the contributions of both Merriman and LSA, and how it has attempted to avoid what we consider limitations and pitfalls of these approaches, trying to propose a way forward towards a critical public archaeology engaged in social transformation in effective and measurable ways.

The project has used both (our) academic and local non-academic knowledge about local territory, prehistory, history, heritage and current social practices and identities, to develop pedagogical units that are adapted to the formal requirements of the national educational system but which achieve the stipulated learning outcomes through engagement with local referents. We have also developed the didactical material to implement those units in two pre-school and two school levels and implemented the units in three public schools of the city of Taltal.

Both the pedagogical units and the didactical material were developed through a transdisciplinary experience including professionals from the social sciences, Education as well as local teachers. The strategy and outcomes of the project take Merriman's and ASL's contribution a step forward, showing a difficult though successful case of a critical public archaeology in a contemporary Latinamerican context.

3 **PUBLIC ARCHAEOLOGY APPROACH IN MUSEUM COMMUNICATION IN NAPLES (SOUTHERN ITALY): PROBLEMS AND NEW PERSPECTIVES**

Author(s): De Vivo, Caterina (Progetto Museo)

Presentation Format: Oral

In the last few years Italian Archaeological Communication had a terrific development and now, many museums seem to apply real audience oriented policies. In this paper, after a short review of the important changes that happened in the last ten years, and of the theoretical debates that is now going on in the country (e.g. are now museums audience oriented just to earn more money and funds?), the results of an important project carried out in the Archaeological Museum of Naples with the Chinese community will be presented. The project was aimed at re-thinking communication material for the Museum that was specifically conceived to present the archaeological heritage to the Chinese culture audience. Although, projects aimed at developing a real intercultural museum communication have been carried out in many European countries in the last decades, this approach was still very new for the city of Naples where Classical archaeological communication has mostly always had an aesthetic approach (Shanks & Tilley, 1992). The presentation of the results of this project will be the occasion to share some theoretical thoughts on the development of a Public Archaeological Approach in the museum communication in Italy.

4 **COULD PUBLIC ARCHAEOLOGY BE APPLIED ON A HYDROELECTRIC PLANT CONSTRUCTION PROCESS?**

Author(s): Rocha da Costa, Maria Clara (Porto University)

Presentation Format: Oral

The construction of the Belo Monte hydroelectric plant at the Brazilian Amazon was and still is a very complex and controversial process in history and politics of Brazil. A project of archaeological heritage management was developed to research about the archaeological potential of the flood area. These research ensured that a preventive archaeology program was established. In between 2010 and 2015 was discovered an important part of the history of Amazonian peoples by the identification of more than 159 archaeological sites. The institution responsible for the archaeological material's custody is the House of Culture of

Marabá. However the space is not yet ready to receive it and the city is not part of the area hit by the flood. The populations affected by the enterprise will not have easy access to the archaeological remains found. With a role almost irrelevant in the project and with little interaction with the local community, would it have been possible to have a public archaeology approach before, during and after this project? This public archaeology approach could be associated with the already existence heritage education programme? The archaeologists should have been more conscious about their the political and ethical responsibility with the archaeological heritage discovered, and mostly with the citizens? The public archaeology could be use to improve the relationship of local population with their archaeological heritage? The purpose of this communication is to try to establish a political and conceptual reflection on how public archaeology would be applied on this situation in every aspect.

5 ARCHAEOLOGY AND THE PUBLIC IN A PROVINCIAL CAPITAL

Author(s): Eldridge, Ryan (Mount Royal University)

Presentation Format: Oral

Over the last 6 years, I was involved in several projects in the city of Edmonton in Alberta, Canada. This city is unique in part because of its status as the provincial capital and in part because of its historical importance. The fur trade history in Edmonton and its connection to First Nations across the Province have created an environment where archaeology often receives both public and political attention. My role in these projects was as a professional archaeologist. The projects range from the fur trade to prehistoric sites each with different provincial requirements and regulations and levels of public involvement.

In this paper, I will explore the elements of public and political engagement with archaeology in each of these projects. I will also discuss commemoration and identity, communicating archaeology to the public and specific stakeholders. Finally, I will touch on elements of professionalism and voluntarism in archaeology and how we have been approaching this process within politically framed requirements and regulations. The paper will provide a survey of what worked, what the challenges were and then reach towards the ideas of public archaeology moving forward.

6 COMMUNICATING ARCHAEOLOGY AT POGGIO DEL MOLINO. VIRTUALIZATION OF THE SITE AND PUBLIC OUTREACH

Author(s): Baione, Carlo (Past in Progress)

Presentation Format: Oral

Archaeology's first concern is the collection of information and their correct interpretation to tell the story (or better, stories) preserved by the stratification of time. Our main concern as archaeologists must be to maintain a communicative relationship with the community which supports our research, strengthening the value of archaeology as a public asset.

Since 2008 archaeologists at the Roman site of Poggio del Molino (Populonia, IT) aims at making daily operations open and accessible to everybody: the project is creating a shared archaeological area, open for the citizen scientists, where the relationship between researchers and public is central. The field research is conducted by professional archaeologists and cultural heritage specialists, with volunteers from all over the world and high school students carrying out ancillary research activities.

Our concern of communicating the discoveries also after the excavation campaigns made it necessary to make the research results tangible and accessible all around the world. The Roman archaeological site is in 3D online on Sketchfab and since 2017 helps Archeodig's professionals to communicate history and to improve the visitor's experience (<https://sketchfab.com/PAr-Co-poggiodelmolino>). Virtual environments can in fact be used to convey more scientific information at many different levels of interest for they can mimic the haptic and visual interactions that defines the job of an archaeologist.

This helps archaeologists at Poggio del Molino to involve citizens in their research and allow them full awareness of the value of the site and its history. Archeodig's choice of crafting 3D digital content aims at facilitating the relationship between the archaeologists and the community of reference who supports it.

7 SPARKING JOY: MARIE KONDO AND THE FUTURE OF PUBLIC ARCHAEOLOGY

Author(s): Oldham, Mark (NIKU - Norwegian Institute for Cultural Heritage Research; Public Archaeology journal)

Presentation Format: Oral

The success of the bestselling book *The Life-Changing Magic of Tidying Up: The Japanese Art of Decluttering and Organizing* and the recent television programme *Tidying Up With Marie Kondo* has brought the ideas of Marie Kondo to a global audience, to the extent that she was named one of the world's 100 most influential people by Time in 2015. While Kondo's book focuses mainly on tidying and decluttering one's home, specifically by discovering which objects 'spark joy', I would argue that there are also a number of lessons for public archaeology.

In this paper, I will look at how the KonMari method can inspire archaeology and heritage management. For Kondo, change in the status of objects is obvious and natural; this aligns with contemporary ideas of heritage as mutable. This is particularly relevant for how we deal with practical policy in the form of 'listing' and conservation, especially in terms of built heritage. Furthermore, the concept of 'sparking joy' is somewhat transferable to current discourses relating to deaccessioning and 'decluttering' museum collections. Linked to this, an embrace of the KonMari method is a means to increase public engagement with archaeology by returning power to the public and allowing people to determine what 'sparks joy'; power would be moved from the anonymous 'expert' to the public, and the heritage professional would become one of many interested actors rather than the sole arbiter of

what is correct.

8 STOP, COLLABORATE AND LISTEN: UCKONIAN PUBLIC ARCHAEOLOGY AS THE RUTHLESS CONSCIENCE OF THE DISCIPLINE

Author(s): Moshenska, Gabriel (University College London, Institute of Archaeology)

Presentation Format: Oral

Fifteen years after Merriman is also 33 years after the viciously contested first World Archaeological Congress in Southampton, UK. The figure behind the emergence of what we might call the 'London school' of public archaeology – Peter Ucko – was also a driving force at the heart of this earlier event. In this contribution I will argue that the principles that drove Ucko's public archaeology at WAC and UCL have grown and dispersed within the discipline. They form parts of the foundations for post-colonial and anti-colonial archaeologies, for 'social archaeology' and for the growth and maturing of archaeological ethics. They have also influenced museology and the field of heritage studies.

But at the same time, I argue that in this growth and expansion of influence there has been a dilution of the radical principles and concepts that surrounded the birth of this public archaeology (and which, to be clear, were always larger and wider than the influence of Ucko alone). In exploring this history I want to reintroduce the idea of public archaeology as the critical conscience of archaeology – an externalists approach, to draw on the historiography of science – grounded in activism, research and praxis. The Uckonian public archaeology that I propose is vocal, difficult, often inconvenient, frequently hostile, and dedicated to the reshaping of archaeology into an anti-hegemonic practice.

Where I have previously explored and celebrated the breadth and variety of definitions of public archaeology, albeit from a largely Anglophone/Global North perspective, I now want to suggest a narrowing of the discipline towards this earlier, more radical and more focused form. This will serve to bring together currently disparate strands of debate, to amplify marginal voices, and to strengthen and radicalise public archaeology at a time when it is needed more urgently than ever.

9 A GLIMPSE INTO THE CRYSTAL BALL OF HERITAGE MANAGEMENT

Author(s): van den Dries, Monique (Faculty of Archaeology, Leiden University) - Schreurs, Jose (State Agency for Cultural Heritage)

Presentation Format: Oral

A prime motivation in public archaeology and heritage management, is passing the memories of the past on to future generations. It is an objective that can be found in many 'old' and new (international) heritage policies, as cultural heritage and the memories attached to it are deemed significant for individuals' and groups' identity, both in the present and in the future. Most heritage professionals still seem to believe in this objective, it is hardly ever questioned. At the same time, there is no evidence that we pay much (actual) attention to those we wish to bequeath, to their values and interests. Looking at future directions in Public Archaeology, should we not particularly consider the future? In this paper, the authors will reflect upon contemporary archaeological heritage management practices, in particular national monument selections, from the perspective of Public Archaeology and possible interests of future generations. We will discuss how we may complete the holistic approach by also thinking of involving the interest and values of the community of those we wish to bequeath.

69 POPULISM, IDENTITY POLITICS AND THE ARCHAEOLOGY OF EUROPE

Theme: Archaeological theory and methods beyond paradigms

Organisers: Frieman, Catherine (School of Archaeology and Anthropology, Australian National University) - Hofmann, Daniela (Department of Archaeology, History, Cultural Studies and Religion, University of Bergen)

Format: Session with precirculated papers

Recent election results, debates and demonstrations leave no doubt: populism is back. History and archaeology are increasingly used to bolster such feelings of resentment of the present by apparently providing a vision of a more flattering past. This is the case e.g. for archaeogenetic narratives which can be spun to support claims of indigeneity and racial purity, heritage presentations which stress the most glorious periods of a nation (as defined by a subset of the population) or romantic notions of a lost folk culture and unity in an as yet unthreatened Fortress Europe.

Archaeology has always been political and archaeologists are very well aware of these appropriations of their work. Yet, we have been largely reactive rather than proactive. A minority of archaeologists have begun to be more directly involved in documenting the crisis as it unfolds, joining activist groups and organisations, and writing archaeological narratives that provoke rather than pander. Yet, as a field, there is a widespread feeling that we can do more.

In this session, we seek contributions which grapple with the interpenetration of populism and European archaeology—in the field, in the classroom, in the museum, on social media or in the legislature. We see this session as an opportunity to develop a proactive stance: How can we avoid the appropriation of our research and react when this happens? How do we choose what to display? Can we use our research to advise policy makers? How can we turn the impact of the media to our advantage? And how do we deal with sites that have a history of misuse or with periods and themes that lend themselves to it? What are the ethics of doing archaeology in an environment of increasingly virulent populist politics?

ABSTRACTS

- 1 NATIONALISM, IDENTITY POLITICS AND THE ARCHAEOLOGY OF EUROPE – A NEW INTRODUCTION TO AN OLD PROBLEM**

Author(s): Hofmann, Daniela (University of Bergen) - Frieman, Catherine (School of Archaeology and Anthropology, Australian National University)

Presentation Format: Oral

Archaeologists have long been aware that their field, like any discipline, is far from politically neutral, but most European archaeologists have not had to grapple with the politics of the field for the last several decades. Instead, the politicisation of archaeological practice was most particularly felt only in certain subsections of the discipline, for instance when working with descendant communities or in outreach. This situation is radically changing. The political agendas of national governments are leading to job losses and the dismantling of organisations and institutions whose research is not in line with the prevailing ideology. Research into genetic histories has reopened ugly debates about essentialised identities. Archaeological data are being operationalised by political actors in ways we archaeologists have little control over. Moreover, all of this is happening in a context in which our research is being much more widely reported on and discussed in a range of media, and not always in ways with which we are comfortable. This can even lead to personal attacks against researchers who speak out.

As this is unlikely to change any time soon, it is imperative that we share examples of best practice and reflect on how the field can best take a concerted stance. We will introduce the session using the example of archaeogenetic research, which –quite against the wishes of its practitioners – is being widely used to drive an agenda of biologised identity, sold as objective fact, which is hard to control and potentially highly divisive. We argue that the first step is to critically reflect on our own disciplinary practices, those of our collaborators, and the structural settings in which research dissemination takes place.
- 2 ETHNIC ESSENTIALISM, CLASH OF CULTURES, BIOLOGISATION OF IDENTITIES. ARE ARCHAEOLOGISTS SUPPORTING RIGHT-WING IDEOLOGIES?**

Author(s): Furholt, Martin (University of Oslo)

Presentation Format: Oral

Since the late 19th century, the culture historian tradition in European prehistoric archaeology has a legacy of being dependent upon concepts infested with ideas of ethnic essentialism, biologisation of identities and homogenization of social groups, downplaying individual agency, social diversity and internal dynamics of communities. These were consciously developed within nationalistic and fascist ideologies. After the catastrophies of the first half of the 20th century and especially, the complicity of many archaeologists with the Nazis in Germany, most post-war archaeologists sought to get rid of these ideas, a struggle that was – on a theoretical level – largely successful. Yet at the same time, the majority of European archaeologists held on to the traditional toolkit, while downplaying or ignoring its ideological background and potential political effects. It seems that this divide between theoretical sophistication, and everyday pragmatic reliance on old traditional models have come back to haunt us in the context of modern aDNA research, which built a lot of its models on outdated culture historian concepts. This is not only problematic because it takes away much of the aDNA’s potential, but it is also troubling because it opens the door to a political misuse of archaeology and archaeogenetics by right-wing forces.
- 3 ARCHAEOLOGICAL INVESTIGATIONS OF IDENTITY: THE TIES THAT BIND**

Author(s): Reiter, Samantha (National Museum of Denmark)

Presentation Format: Oral

Identity and migration are becoming the fulcrum of the post-modern world. It comes, therefore, as no surprise that these themes have taken central stage in archaeological investigations in Europe today. Recent advances in tracking migration through aDNA analyses, linguistic studies and multi-analytical isotope investigations have provided yet another layer of information about the mobility and identity of people from the past. However, the conclusions of these studies are often understood along very sharp lines rather than through an organic manner which embraces the interface of culture, biology and language. Through examination of current misconceptions surrounding the DIY DNA fad and the uses and abuses of cultural identity symbols in warfare, this paper first illustrates the enormous power of ancient identity markers in the here and now and the confusion and misunderstandings that derive therefrom. It finishes by offering a series of different possibilities for archaeologists to attempt to engage with current political debate and to maintain a degree of control over the initial presentation of their results to the public.
- 4 CONDITIONS OF INFLUENCE: WHAT ENABLES THE SCANDINAVIAN POPULIST RIGHT TO IMPACT HERITAGE GOVERNANCE?**

Author(s): Holleland, Herdis (Norwegian Institute for Cultural Heritage Research - NIKU) - Niklasson, Elisabeth (Stanford University)

Presentation Format: Oral

Since the early 2000s a nationalist wind has swept over Scandinavia, enabling its three major right-wing populist parties – the Danish Peoples Party, the Progress Party (Norway) and the Sweden Democrats – to gain influence in state matters. This ought to

concern archaeologists and heritage scholars for several reasons. The most obvious is their apparent enthusiasm for heritage, and the privileged position heritage holds in many of their narrowly conceptualized cultural policies. In this paper we seek to move beyond the obvious, however, and address a more fundamental question: What political, bureaucratic and societal conditions need to exist for far-right parties to influence the way heritage is done in liberal democracies?

Using Scandinavia as our case area, we propose three such conditions: 1) A repositioning of the 'Overton window', i.e. the window that encompasses the range of ideas tolerated in public discourse at a given time. As the window of normality is extended, heritage can be activated in the service of exclusionary ideas such as Scandinavian welfare chauvinism. 2) Gaps left by changes in governance – following New Public Management, mainstreaming of neo-liberal economic policies and measures to reduce bureaucracies – have enabled a marriage between the rhetoric of democratization and structural decentralization, creating an opening for populist right influence. 3) The destabilization of the traditional block-politics in the multiparty systems of Scandinavia, and the prevalence of weaker minority governments, have been crucial for creating spaces wherein heritage policies and budget initiatives can be negotiated. Although some of these conditions are specific to Scandinavia, most can be applied broadly, making them interesting starting points for comparison and debate.

5 THE BATTLE OF HAFRSFJORD, AD 872: VIKINGS AND THEIR IMPORTANCE TO THE NORWEGIAN NATION, THEN AND NOW

Author(s): Petersson, Håkan (University of Stavanger)

Presentation Format: Oral

In recent years, Vikings have experienced a resurgence in popularity. An ever-growing tourist industry, particularly cruise tourism, has sought to capitalize on this popularity. There is, therefore, great political and economic interest in the Viking history and culture. But herein lies a conflict. On the one hand are the archaeological facts, which generally consist of either rich, often female, graves or ordinary settlement/production sites representing everyday rural life. On the other hand, is the stereotype, which tourist seeking and tour providers thus interested in presenting, of a androcentric society steeped in violence and based on pillaging. One of the main historical events of the period is the Battle of Hafrsfjord, in AD 872, which is said to have unified Norway into a single kingdom. The battle is of great importance, but is also widely debated amongst archaeologists. Currently, there is discussion about establishing a large visitor center at the presumed site of the battle. The suggested content of this center reinforces this androcentric stereotype, focusing on the roles of men, power, warriors and the plundering of the British Isles.

What is the effect of this? What is the role of current research in this context? How should we react and/or interact with these ideas, or not? Further, what about our own role in this? What is the museum itself presenting in its exhibitions? Do we have to adapt, to this opportunism of the Viking Period to influence what is popular? Alternatively, can we, through integration and active participation, get people, politicians and investors to engage in a more comprehensive, research-based narrative? Or else, how does these popular presentations affect our view of Norwegian national identity and our own historical selves?

6 IN A POST-TRUTH WORLD IT IS THE POWER (OF EXPRESSION) AND LANGUAGE (GAMES) THAT MATTERS

Author(s): Baca, Martin (Department of Archaeology, Faculty of Arts, Comenius University in Bratislava)

Presentation Format: Oral

This paper is loosely inspired by Timothy Snyder's last book „The road to unfreedom“. I will deal with the nature of concepts and how we archaeologists/people communicate with each other. We shall discuss the word „fascism“, the word used/abused today maybe more than ever since the 1930s. This abuse in former Eastern bloc has its roots in communist propaganda of the 70s/80s, when we were taught, that fascism is a danger coming from the west. Therefore this word generates much more different meaning to general population for example in Britain, than to general population in former Czechoslovakia. It is associated with German Nazism and with liberal democracy at the same time – an extraordinary paradox. In a world, which wants to express itself into a few sentences on social media (140 characters on Twitter), the shortcuts which means everything and nothing at the same time are crucial. Therefore the abuse of word „fascism“ goes hand in hand with completely new words such as „slničkár“ („slničkár“ in Czech language) – the person who sees the world as great place to live for everyone. Because in a populists world, only the people seen as „normal“ or „ours“ are people which should share the same world with them. This is actually something, which falls into the nature of what word „fascism“ should mean. For populists of today – concepts of love, welfare, hope and the most importantly – the truth – are deconstructed, shredded to pieces. We are in war with populism, this schizo-fascism, we are losing and we have to fight back. We as archaeologists cannot remain silent. We have to explain the complexity and colourfulness of the past to the public, so they will understand. Remember, the people who adore the “narratives of eternity” are stealing the past for themselves.

7 THE POSTNATIONAL CRITIQUE – A RESPONSE TO REACTIONARY POPULISM?

Author(s): Hanscam, Emily (Durham University)

Presentation Format: Oral

Archaeologists have long recognized the deep connection between archaeology and nationalism. The resurgence of reactionary populism requires a renewed scrutiny of this relationship, aiming towards positive action for a more inclusive future. A postnational critique offers the potential to understand how the study of the past intersects with national narratives and articulates

new ways of acting against it. Postnationalism theory presents one way of addressing both the present political situation and the need to rejuvenate archaeological theory to meet this danger—it provides both a warning of how nationalism continues to influence research and an entreaty for archaeology to embrace its political nature. The postnational critique advanced here identifies and questions the use of material and textual evidence from the past in support of methodological nationalism, arguing against the perpetuation of exclusive categories of identity and dualities such as ‘civilisation versus barbarism’. By exploring the history of Roman archaeology in Romania and the public reception of Roman studies in Britain through the postnational critique, this paper argues that while the past has always been and always will be political, archaeology as a discipline is at a watershed moment—archaeologists must become unapologetic political actors.

73 MESSY METHODS: HERITAGE STUDIES AND THE QUEST FOR MULTI-METHODOLOGICAL APPROACHES

Theme: Archaeological theory and methods beyond paradigms

Organisers: Holleland, Herdis (Norwegian Institute for Cultural Heritage Research - NIKU) - Niklasson, Elisabeth (Stanford University)

Format: Discussion session

Heritage is at once rational and illogical, inclusive and exclusionary, feel-good and contentious, elitist and egalitarian. In other words; heritage is a mess. From time to time, in its quest to be interdisciplinary, heritage research has come to mirror the mess it studies. Principles, theories, methods for analysis and methods for data collection have blended together, and heritage is variously treated as an object of study and an analytical lens.

In contrast to social sciences where ‘how to do’ books are common currency, heritage studies is characterised by a lack of hands-on method and study guides. Stig Sørensen and Carman’s decade-old “Heritage studies: Methods and Approaches” is a noble exception. As the first comprehensive volume dedicated to heritage studies as a distinct field of investigation in archaeology, it assigned an important task to future researchers: to clarify the scope and nature of the empirical material used in heritage studies, and to develop a deeper understanding of how different analytical methods and techniques work together – recognising their advantages and pitfalls. Ten years down the line, the question is, how far have we gotten?

In this session we aim to revisit this challenge. By inviting heritage researchers to share their conceptual conundrums, empirical blunders, and methodological misfortunes, as well as their pragmatic solutions and analytical triumphs, we seek to promote more stringent multi-methodological approaches in heritage studies. That is, we want to explore when and how the multi-temporal, multi-scalar and multi-sited topic of ‘heritage’ requires researchers to combine different methods, and what it takes to make these combinations work.

1 ARCHAEOLOGY ‘OFF THE RECORD’ – ETHICAL AND METHODOLOGICAL CHALLENGES WHEN STUDYING UP

Author(s): Niklasson, Elisabeth (Stanford University) - Holleland, Herdis (Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

The past is no longer what it used to be, and neither is archaeological fieldwork. Over the last decade archaeologists studying the politics of the past have expanded their analytical and methodological tool-kit to include ethnography, qualitative interviews and textual analysis. Moving beyond the aim of showcasing how sites and narratives were (mis)used in the 20th century, researchers have begun to study heritage policy and archaeopolitics “in situ”. As heritage researchers or interns, they participate in UNESCO meetings, EU panels and national parliamentary sessions, examining by what means and to what ends the past is mobilized right now. This new focus on institutions and people of power has paved the way for a deeper understanding of the inner workings of heritage politics and governance, including the conditions that make (mis)uses of the past possible. It has also, however, meant stepping onto a minefield of ethical and methodological issues that archaeologists are often ill-prepared to navigate. In this contribution we draw on our experiences studying the politics of the past in UNESCO and the EU to address two such interconnected issues: firstly, how to acquire empirical material that tells you not just what people are up to, but what they “think they are up to”, and secondly, how to deal with such unofficial and sometimes sensitive information once you have it. Alongside examples of our own failures and successes, we draw on the growing body of policy research and propose multi-methodological strategies that can strengthen interpretations and claims based on such information.

2 TRIANGULATION, MIXING OR COMPLEMENTARY? (JUST KEEP IT SIMPLE, STUPID!)

Author(s): Axelsen, Irmelin (Museum of Cultural History University of Oslo)

Presentation Format: Oral

When I began developing my PhD project in the spring of 2016 it very early became clear that my somewhat broad purpose statement, mostly concerned with intangible phenomena, needed various methods and different types of material to be properly explored and analysed. Initially I chose a threefold approach — a questionnaire, qualitative interviews and a distribution analysis — and went with the term ‘triangulation’.

Little did I know about the many positivistic pitfalls associated with the approach. When looking for alternatives I discovered Mixed Method Research (MMR), which seemed promising. Alas, all textbooks and articles described long lists of what to do, how

to do it, and in which order to do it. There seemed to be a strong belief that 'noise' in the data could be eradicated if only the study design was strong enough.

I opted to keep looking. Fortunately, a level-headed professor, leading a beginners course in qualitative methods, came to my rescue. She shrugged her shoulders at the conundrum many of the anxious PhD students felt they were facing when wading through the methodological jungle, attempting to find a suitable match for their work, and said: 'Why make it difficult? I just call the use of two or more methods in a study complementary'.

There has, of course, been bigger challenges than choosing a term to describe the implementation of several methods for someone with a traditional archaeological education. How to get research participants? How and when to apply for permission to conduct interviews at all? How to ensure reliability and validity between the various methods? So far, the pragmatic and no-nonsense mindset distilled upon me at the course at the Faculty of medicine has served me well. Arguably, the KISS principle, and openness about all shortcomings, has a place in heritage research too.

3 **200 YEARS AFTER NAPOLEON: RÄTSEL, ÉNIGMES, AND CONUNDRUMS OF AN INTERNATIONAL STUDY ON THE COMMEMORATIONS OF THE NAPOLEONIC WARS**

Author(s): Nienhaus, Luisa (UCL Institute of Archaeology)

Presentation Format: Oral

Between 1803 and 1815, Europe was at war: to this day, the Napoleonic Wars divide and unite people and nations. The provision of long-term peace for Europe was at the heart of the Congress of Vienna, a legacy on which the European Union has been built.

This paper takes an interdisciplinary multi-methodological approach to investigate how visitors' national and European identity influence the way in which they perceive sites associated with the commemoration of the Napoleonic Wars.

Visual and discourse analysis of images, monuments and memorials as well as historical and contemporary documents are important sources for this study. However, this paper will critically engage with methods applied for on-site data collection in 2016 and 2017, such as visitor observations and questionnaires, along with the statistical analyses of 2000 data-sets.

In 2016, two questionnaires, were trialled at three selected sites: Mémorial 1815 (Belgium), Völkerschlachtdenkmal (Germany) and the National Museum of the Royal Navy (United Kingdom) (n=600). The collected data highlighted a significant underrepresentation of French nationals in the sample, which in the study's context was a substantial issue in need to be resolved. Thus, the Musée de l'Armée in France was included, capturing a French perspective.

Drawing on the analysed data from 2016, a new questionnaire was developed and used at all four sites in 2017 (n=1400). The data demonstrate that, Europe's more recent conflicts not only influence different nations' perception of World War commemorations but also of the Napoleonic Wars. Euroscepticism, Brexit and the rise of the far right, are current trends which, to a degree, are represented within the data.

This international study presented various conundrums which were of human as well as methodological nature. However, the biggest conundrum was to develop an approach and questionnaire which would enable a comparative study between four very different heritage sites.

4 **NAVIGATING ETHICS AND METHODOLOGY: RESEARCHING THE STUDY OF CONTESTED DEAD SEA SCROLLS**

Author(s): Rasmussen, Josephine (University of Agder)

Presentation Format: Oral

Since 2002 more than 75 new "Dead Sea Scrolls" fragments have surfaced on the antiquities market and subsequently been scientifically published. Over the last couple of years, however, a growing consensus that the majority of these are in fact forgeries (cf. Davis 2017), created to meet demands in the relevant markets (Justnes 2017; Justnes and Rasmussen 2019), has emerged. This raises pertinent questions about why the scholarly tradition and research practice in Dead Sea Scrolls studies has allowed the inclusion of dubious (forged and illicitly obtained) manuscripts and objects into their datasets. This topic is approached in a current collaborative research project involving ancient text scholars and archaeologists alike. Archaeology and heritage studies encompass critical perspectives on provenance and ownership that are both relevant and controversial in such a research setting.

In this presentation, the methodological and ethical pitfalls and concerns associated with studying the study of Dead Sea Scrolls, are addressed.

5 **WHAT DOES THE HUMAN GEOGRAPHY BRING TO THE ANALYSIS OF HERITAGE PROCESSES?**

Author(s): Duval, Mélanie (EDYTEM; RARI, Wits University) - Brancelj, Ana - Gauchon, Christophe (EDYTEM)

Presentation Format: Oral

The aim of this contribution is to examine how human geography is relevant with analyzing heritage processes and what is the specific feature of this discipline in the field of Heritage Studies. The process of heritagization consists of attributing heritage values based on criteria that evolve through time and in conjunction with socio-cultural contexts (Smith 2006). As a socio-spatial production, heritage objects are at the same time the indicators of the choices made by the societies (Graham et al. 2000). How human geography can help to understand the process of the heritagization? What are the advantages of the discipline and

how could it be combined to other disciplines to go deeper in the understanding of heritage issues?

Crossing archaeological case studies focused on rock art sites (France, South Africa and West Indies) and pile dwelling sites (Alpine area), our aim is to present the methods used by human geography to analyze what is at stake in the heritage processes. Through the analyze of territorial context, we will discuss how human geography is relevant to understand the stakeholders positions and the choices they make in the heritagization process: choices made in terms of space (forms and limits of the heritage areas), choices made in terms of values (definition and attribution of heritage importance) and choices made in terms of publics in charge of the heritagization process (the production of the authorized Heritage discourses and population involvement). Through a pragmatic approach, we will present how we practice human geography in the field of Heritage Studies, explain our methodology, the kind of data we use (quantitative, qualitative, maps), with a focus on the chronosystemic timeline a useful diachronic and systemic tool to examine how and why an object or a place becomes heritage.

6 FROM THE DUMP TO THE GRAVE- SEARCHING FOR HISTORIES OF ARCHAEOLOGY OUTSIDE THE ARCHIVE

Author(s): Berg, Ingrid (Stockholm University)

Presentation Format: Oral

History of archaeology is a vital part of archaeological self-representation. Through the creation of histories of archaeology, we legitimize current praxis, create ancestors, role models and warning examples, and critique and debate past practices. We remember and forget through the stories we tell. In short: histories of archaeology are our intra-disciplinary heritage.

History of archaeology has for years been associated with the study of archives. The archive is a situated blessing and curse, since its content and organization dictate the knowledge production.

In this paper, I want to explore how past archaeological practices and professionals materialize outside of the archive though sharing my own attempts at locating 'alternative materialities' of archaeological history. I will use my PhD thesis, *Kalaureia 1894: a Cultural History of the First Swedish Excavation in Greece* (2016), as a case study. I documented dump piles and trench ditches as monuments of practice, I made stylistic analyses of 19th century grave stones, and I studied threshing floors and possible turn-of-the-century tent pegs in search of a more complicated history than that preserved in the official archives. My combination of a micro-historical methodology with an archaeological eye for materiality had varying results, some made it into the book, others are left on the dump.

Arguing that the archive is the material manifestation of power-relations in the past, thus influencing the stories we tell, I want to urge critical histories of archaeology to widen the search for alternative materiality.

7 TRAVELS IN ELUCIDATING MY LIFE, AS A VALUED AND AUTHENTIC REPLICA

Author(s): Foster, Sally (University of Stirling)

Presentation Format: Oral

With Professor Siân Jones of the University of Stirling I have recently completed ethnographic assessment designed to understand the contemporary authenticity and value of a historic replica (*International Journal of Heritage Studies and Conservation and Management of Archaeological Sites* 2019). Our subject was the 1970 concrete St John's Cross that stands outside Iona Abbey (Scotland) in front of the burial place of St Columba. This research examined how replicas 'work' at a heritage site and unravels the part that social relations, place and materiality play in the production and negotiation of their authenticity. It shows that replicas are important objects in their own right, acquiring value, authenticity and aura. The 'life' of a replica generates networks of relationships between people, places and things, including the original historic object. All so good, but what happens when one of us seeks to add a cultural biographical time-depth to this ethnographic study, drawing on very different sources? How and to what extent can we critically explore our themes of social and material networks, place and displacement, materiality, craft, creativity and biography in a historical context? What do we learn by comparing our rapid ethnographic study with a near-contemporary full ethnographic study of the island exploring how specialness is constructed in relation to Iona? Writing and citing using such interdisciplinary approaches and sources for *My Life as a Replica* is certainly proving messy. If I was starting again, what would I do differently?

8 ORGANIZED PATCHWORKS: EXPLORING HERITAGE PARTICIPATION WITH COMBINED METHODOLOGIES

Author(s): Ripanti, Francesco (University of Pisa)

Presentation Format: Oral

Multi-methodological approaches lay at the roots of heritage studies. Drawing from the 'toolbox approach' defined by Mason, the use of different methods and techniques serve in collecting complementary pieces of information with the aim of gaining robust results, addressing the issues related to conservation, management and promotion.

As well, my PhD research took advantage of the combination of different methods and techniques to study the participation promoted in three Italian community archaeology projects. This paper wants to describe the workflow used in the research with different aims: to identify and question the workflow's strengths and weaknesses; to show how and why the combination of methods and techniques supports the collection of new data; to report how these data inform some insights suggesting detailed images of participation.

Specific focus will be dedicated to introducing and critically addressing how the interaction between traditional techniques - such as interviews, focus groups and value-based stakeholder analysis - and original use of some techniques - for example participation maps, polarised chart, and the use of storytelling for heritage research - assists and enhances the study of heritage participation.

9 A MIXED BAG: DEVELOPING A METHODS 'TOOLKIT' FOR ASSESSING THE SOCIAL VALUES OF HERITAGE

Author(s): Robson, Elizabeth (University of Stirling)

Presentation Format: Oral

The social values of heritage are often seen as secondary to 'objective', scientific assessments of significance. One of the reasons proposed for this is the lack of appropriate methods and associated expertise for the assessment of social values within routine heritage management. Could a multi-methodological approach help practitioners to identify and work with social values? If so, what are the difficulties in implementing such an approach alongside more established methods of significance assessment?

This paper considers the above questions through the lens of on-going research to develop a hands-on methodological 'toolkit' on the assessment of social value for heritage practitioners. The research is based on a set of comparative case studies, trialling multiple qualitative methodologies and rapid, participatory approaches to assess the social values of a range of historic places in Scotland. The case study findings will be used to illustrate the problems, challenges and opportunities that arise in selecting, combining and implementing different methods and techniques. The paper will also touch on some of the institutional constraints that practitioners have identified when it comes to incorporating multi-methodological approaches to assessing social value into established ways of working.

It is argued that qualitative, participatory methodologies can complement existing assessment practices; helping to bring plural and dynamic social values into conservation management practice. However, for these methods to be most effective, heritage professionals need the scope to work flexibly and the expertise to develop approaches that are responsive to specific social and conservation contexts.

10 MESS IS GREAT. IT CHANGES THE CORE! THE NATIONAL TRUST OF AUSTRALIA (VICTORIA) AND PRODUCTIVE MESSINESS

Author(s): de Jong, Ursula (Deakin University, Geelong) - Garduno Freeman, Cristina (The University of Melbourne)

Presentation Format: Oral

The National Trust of Australia (Victoria) offers a way to examine how 'messiness' is productive for the practice and discipline of heritage. Since its establishment in 1956, the work of the National Trust has moved from the cutting edge of the past - classifying 'old buildings' - to the cutting edge of the present - digital advocacy and activism. The core of heritage lies in fixed structures, legislation and governance, charters, conventions, designations and lists across multiple levels. But fundamentally heritage is a social phenomenon - it is about people, and what they value and therefore is constantly changing. As an independent member-based organisation The National Trust has always worked on the fringe where the messiness lies. In the 1960s and 1970s social value was not recognised, peoples' voices were not heard; their voices muted from the core. But by the 1990s social value was embedded in the Burra Charter. The edges, the mess had changed the core of heritage. Today the National Trust continues to operate at the periphery, seeking to extend heritage by advocating for the recent as well as the past. The Trust's 2018 nomination of Melbourne's Federation Square challenges traditional perceptions, as does the digital activism led by the organisation to retain the public square for the city's people. The edges and core of heritage are constantly shifting, and this is a good thing. While their relationship is transient, discordant and truculent, it is essential, as it provides the energy and movement that pushes the fringes into the core. Of-course the National Trust is just one organisation disrupting the core. But its story can resonate with the purpose of such work and allow us to appreciate how the contingent, ambiguous and dynamic roles such organisations play are as critical as the core instruments that govern heritage.

11 CLEARING UP A MESS WITH THE ANALYSIS OF CONCEPTS AND DISCOURSES

Author(s): Enqvist, Johanna (University of Helsinki)

Presentation Format: Oral

This talk presents a methodological approach that draws from sociocognitive approaches of terminology and critical discourse studies to create analytical tools for dissection and critical assessment of the conceptual and theoretical framework of heritage studies. The perspective suggested here is based on an idea that heritage scholars represent a specialised epistemic community that shares a knowledge system which is organised and structured by hierarchical categories of concepts (or 'units of understanding'). Concepts and their linguistic representations - terms - thus reflect how knowledge is structured in the experts' minds in particular social settings i.e. discourses, that is context-specific frameworks for making sense of some aspect of reality.

Therefore, the essential key to the investigation of the structure, accumulation and interdisciplinary links of research knowledge, or the socio-political and cultural impact of that knowledge for that matter, lies in the analysis of the concepts and the multiple discourses in and to which they emerge, transfer, transform and attach. Furthermore, concepts are considered as culturally, bodily and perceptually based; metaphorical models link the language system to the world of experience and to the functioning

of the mind. Consequently, and in contrast to the understandings and criticisms of discourse as solely linguistic and thus exterior to material reality, the concept of discourse is regarded as a multi-modal, multi-semiotic and historically contingent social practice.

As a pragmatic solution and practical application for analysing and representing knowledge that is concentrated in the concepts, this talk also introduces a multilingual and multidisciplinary research infrastructure project “The Helsinki Term Bank for the Arts and Sciences” (HTB) coordinated at the University of Helsinki. The HTB maintains a wiki-based, constantly updated website (titeentermipankki.fi) which offers a collaborative platform for terminological work and conceptual analysis for experts and a discussion forum available for all registered users.

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DE-COLONISATION AT EAA 25 YEARS ON: THE SOCIAL-ECONOMIC CONTRIBUTION OF CULTURAL HERITAGE CONSERVATION

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Godfrey, Evelyne (Uffington Heritage Watch) - Mödlinger, Marianne (University of Genoa) - Joosten, Ineke (Cultural Heritage Agency)

Format: Regular session

Twenty-five years ago, when the first annual meeting of the EAA took place, the term ‘de-colonisation’ was practically unknown. De-colonisation today forms a major challenge in heritage management, and represents a growing issue, both between European states and outside Europe.

The case that successive Greek governments have made to Britain for the repatriation of the Parthenon marbles, for example, is still unresolved, while in France, the country’s president recently called for the restitution of African cultural patrimony from French museums over the next five years.

We will discuss different approaches in Europe and beyond as to how the objects concerned are identified, how/if they are ‘repatriated’, and how politics are involved, as well as social-economic consequences for the museums concerned and for the communities to which cultural material is restored.

The contribution that conservators and archaeological scientists make to public concepts of the ‘ownership’ of cultural heritage can help to structure and support contemporary de-colonisation in a positive way. In this session we seek to examine:

- what are the best practices for dealing with archaeological artefacts “collected” (in retrospect, sometimes looted?) from sites in former colonial nations;
- how conservation and scientific analysis help inform the archaeological narrative;
- who, in an era of public funding cuts, will be responsible for the scientific analysis of archaeological sites and artefacts;
- how digital solutions, such as virtual reality, can be successfully used as innovative mediation methods in archaeology, e.g. with regard to human remains, and in reconstruction of sites and objects;
- and what strategies can be recommended for artefact storage and presentation.

In this session we aim to encourage considerate discussion of the evolving contribution of archaeological conservation and the political and social-economic impacts of de-colonisation in the 21st century, 25 years on from the founding of the EAA.

ABSTRACTS

1 IS THERE A FUTURE FOR ARCHAEOLOGY IN “DEGROWTH” (FRENCH: DÉCROISSANCE)?

Author(s): Zorzin, Nicolas (National Cheng Kung University)

Presentation Format: Oral

Since the 1950s, Cultural Heritage Management (CHM) and archaeology (in its CRM form), slowly emerged as professional activities in numerous developed countries. Even though the initial but vague definition of CHM’s goal was: “preserving heritage for the benefit of future generations”, since the 1980s, CHM has been embedded in a dominant ideological-economic system, namely: neoliberalism or hyper-capitalism, which is not necessarily compatible with the latter definition. In fact, practitioners have been increasingly pressured in mimicking both efficiency and quantifiability of modern-management to avoid slowing-down development activities, ultimately reshaping CHM to make it compatible with profits making and economic growth.

Most CHM specialists, including archaeologists in CRM, had no alternative but to adapt by embracing a simplistic (but self-preserving) “sustained optimism” (Hutchings 2018:80) in defining their missions, i.e. assuming that technical solutions can be found, and “sustainable” compromises can be achieved between development and preservation of archaeological heritage.

Yet, the failures of such a model have been countless since the 1990s and the attempts to instrumentalise its use to serve the interests of specific stakeholders has been equally uncountable (notably through the colonization of the vocabulary; e.g., the use of the oxymora: “sustainable development” and “resource management”). As such, defining a future for archaeological heritage management in such context is problematic.

Likewise, it is now apparent that the ongoing global ecological disaster we are facing cannot be reversed with compromises but rather with a frontal resistance against the injunction of economic growth. Whether it is ecology, CHM or archaeology, it is now

time for a “radical engagement” truly challenging the neoliberal self-destructive order. To do so, I intend exploring the concept of “degrowth” to propose a new paradigm for our discipline by a change in CHM practices opposing the logic of economic growth.

2 HOME AND NATIVE LAND: DE-COLONISATION AND THE EARLIEST FRENCH SETTLEMENT IN CANADA (PORT-ROYAL NS)

Author(s): Godfrey, Evelyne (Uffington Heritage Watch)

Presentation Format: Oral

A full-scale historical reconstruction of the earliest permanent French colonial settlement in Canada, the 1605 Habitation at Annapolis Port Royal in present-day Nova Scotia, began in 1939 and was completed in the early 1940s. Since then, the reconstructed fort complex at Port-Royal has been a registered National Historic Site, maintained by the Canadian Federal government agency Parks Canada. The reconstruction was based on 17th century drawings and written accounts of the European colonists. There were no standing remains on the site and the reconstruction was not based on archaeological excavation or survey to locate the original settlement. The Indigenous side of the story was apparently largely silenced. The Port-Royal site is very much in keeping with the ideology of the ‘Monument Movement’ projects that started in North America in the 1920s to late 1930s; for example, Colonial Williamsburg, Virginia, USA from 1927 onward, and Fort Henry in Kingston, Ontario, Canada from 1936. A direct American influence can be discerned in the Canadian historical reconstruction sites, including the later project at Fortress Louisbourg, Nova Scotia. The motivation at the time for creating these tourism venues arguably included establishing a ‘unified’ sense of the modern national identity via control of the historical narrative. This paper will briefly review the contemporary need for archaeological and conservation work in the region of Port-Royal, and discuss how the historical narrative is currently being conveyed at the site. Suggestions will be presented as to how progress can be made towards de-colonising the cultural heritage landscape.

3 SHARED CULTURAL HERITAGE OF THE NETHERLANDS. A SHARED HISTORY, A SHARED FUTURE

Author(s): Joosten, Ineke (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

How does the history of the Netherlands continue to influence Dutch society and our international relations? The language we speak, the food we eat, the buildings that surround us and the stories we pass on bear many traces of a shared history with other countries, among them Australia, Brazil, India, Indonesia, Japan, Russia, Suriname, Sri Lanka, the United States and South Africa. The Netherlands is now working with these countries to preserve the significance of these historical links for future generations. The Shared Cultural Heritage programme is part of the Netherlands’ international cultural policy. For the 2017-2020 period, the Dutch Ministries of Foreign Affairs and of Education, Culture and Science have formulated a policy for this programme that focuses on ten partner countries: Suriname, Brazil, the United States, Russia, South Africa, India, Sri Lanka, Indonesia, Japan and Australia. The programme operates on three basic premises:

- Cooperation based on equality, reciprocity and respect for ownership is at the core of our commitment to our shared cultural heritage.
- International cooperation is needed if we are to preserve and manage this shared cultural heritage and make it accessible.
- The participation of the public is essential for the sustainable development and repurposing of cultural heritage.

Within the Shared Cultural Heritage Programme, the Cultural Heritage Agency supports local experts in partner countries by promoting the exchange of knowledge and capacity building. The instruments that the Agency uses are training, advice and knowledge products such as handbooks and inventories.

4 DE-COLONISATION: CURRENT TRENDS IN EUROPEAN POLITICS IN RESTITUTION CULTURAL HERITAGE

Author(s): Mödinger, Marianne (IRAMAT-CRP2A Université Bordeaux Montaigne)

Presentation Format: Oral

De-colonisation is a growing issue in, and not only, European heritage management and politics. Especially politics discovered the topic during the last few years and use the restitution of a few selected objects to improve their visibility and gain positive publicity. De-colonisation itself is seen by museums and cultural heritage institutions both as ‘opening Pandora’s box’ (as in the case of recent restitutions by E. Macron, France), or as an overdue act. At least in public, topics as ideal conservation, exhibition, or accessibility of the objects to the local public seem to be less important.

Some countries, as Germany, are putting significant sums behind restitution research into objects from colonial contexts. Being today (late enough!) only at the beginning of the process of restitution of objects from colonial context, or expatriated during colonial times, it is even more important to find strategies to guarantee both visibility, accessibility, and conservation of the objects concerned.

This presentation aims to give an overview on current politics and strategies of de-colonisation.

5 CROSS-CULTURAL UNDERSTANDING AND THE RECOVERY OF HISTORIES IN POST-COLONIAL TIMES: AN ARGUMENT FOR EPISTEMOLOGICAL DECOLONISATION FROM SOAS, UNIVERSITY OF LONDON

Author(s): Istratii, Romina (SOAS University of London)

Presentation Format: Oral

The discourse of decolonisation has become increasingly salient in British and European Universities, but how decolonisation is to be understood is a question that each institution, discipline and scholar must explore from their unique location in global geography and history. At SOAS the debate has been equally diverse with an emphasis being placed on decolonising the curriculum, diversifying taught syllabi and improving pedagogies to engage more interactively and substantively with minority students. Research students, acting through the platform of the SOAS Journal of Postgraduate Research (SJPR), have recently placed emphasis on decentring western epistemologies. As a previous editor-in-chief of SJPR, I will focus my presentation on epistemological decolonisation, which may be understood as a deeper reflection into the historical mechanisms of knowledge-making and its colonial and ethnocentric underpinnings. It is imperative to recognise that knowledge, as well as the standards that determine what makes valid knowledge, have been disproportionately informed by western systems of thought and ways of reflecting about the world. Promoting cross-cultural understanding and recovering global histories, which precisely falls within the remit of archaeological and culture studies, requires both reflexivity on epistemological hierarchies and willingness to understand the world through the belief and knowledge systems, lived experiences and aetiologies of the local insiders.

6 INTANGIBLE ARCHIVES AND 'COLONISED NARRATIVES'

Author(s): Gallinaro, Marina (Dipartimento Scienze dell'Antichità. Sapienza Università di Roma; Cotsen Institute of Archaeology. UCLA)

Presentation Format: Oral

In the last decades the archaeological research carried out in Africa by foreign groups of research changed methods and approaches, adopting a de-colonisation and a post-decolonisation perspective aimed at a more effective collaboration with the local community. This still far than a complete process is rapidly becoming at least a professed standard.

This paper will discuss a case study from the central Sahara (SW Libya), where any fieldwork activities have been suspended in 2011 due the so-called Arab Spring and the following political instability: this situation has complex implications with the de-colonisation process. This area is worldwide renown for the presence of rock art sites of outstanding value, some of which have been included in the UNESCO WH List, and are actually in the endangered list. Revealed to the Western world since the mid of XIX century, they represent an extraordinary example of a "colonised narrative". Setting apart few cases of painted or engraved blocks that have been exported in the past and are now in the exhibitions or in the store of Europeans museums, the heritage is still in situ, and subject to natural and worrying anthropic threats. Since a few decades ago a distorted narrative about this heritage has been proposed on the basis of the (often only partially correct) reproductions done by professional painters that followed the researchers in the field. Furthermore, photographic archives are currently becoming accessible online, without any information about the contexts, potentially generating new narratives. A new approach proposed by the ASArt-DATA project (my MSCA Global fellowship project) will be discussed.

The present state is paradoxical: a mass of documentation and the main researchers are based in colonial countries, but the de-colonising world is at risk. Which is the correct way to contribute to the - nevertheless ongoing- de-colonisation processes?

76 SYSTEMIC APPROACHES TO JUVENILE FUNERARY RITUALS. ATYPICAL, DEVIANT OR NORMATIVE? GOING BEYOND PARADIGMS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Gonzalez Alaña, Ian (Université Paul Valéry Montpellier 3, UMR 5140 Archéologie des Sociétés Méditerranéennes) - Le Roy, Mélie (Chercheuse Postdoctorante LabexMed MMSH - LAMPEA UMR7269) - Murphy, Eileen (School of Natural and Built Environment Queen's University Belfast)

Format: Regular session

Funerary and mortuary studies related to immature individuals have made major advances in recent decades with the development of new approaches, largely related to initiatives in osteoarchaeology and gender studies. Additionally, the increased use of archaeoethnology, which places the dead at the center of such rituals, serves to remind us that the deceased individual was the main focus of the mortuary activity in the past. The entire burial ground being interconnected, should be studied as part of a system of rituals and beliefs. Most of the archaeological evidence gathered to date has indicated that the funerary rituals associated with newborn and sometimes older infants vary greatly compared to those afforded to older juveniles and adults. Perhaps we should not be entirely surprised at this situation since contemporary authors from antiquity, for example, describe how the death of a baby or young child could perhaps be considered in a different way.

Archaeologists generally consider the burials of juveniles in a different way to those of adults but they cannot be certain that the proscribed rituals are structurally different to those of the remainder of society. As such, the crux of this session will be to determine how we interpret the funerary rituals afforded to children of a variety of ages. Should they be considered as atypical, deviant or normative within particular societies?

In this session we ask for original contributions regarding juvenile funerary rituals from all periods and geographical areas. We

ask contributors to not only focus on descriptions of the skeletons and burials but rather, we wish the main focus to be on interpretation and take an archaeoethanatomical and systemic approach, that contextualises the findings more broadly in relation to the society in question. Using this approach, it is hoped that we can go beyond paradigms concerning juvenile funerary rituals.

ABSTRACTS

- 1 AS WHITE AS SNOW, AS RED AS BLOOD. MOMENTS OF MEMORY AND BELONGING: A SPECIAL CHILD BURIAL FROM NEOLITHIC BA'JA**
Author(s): Benz, Marion (University of Berlin; University of Bern) - Gresky, Julia (German Archaeological Institute, Berlin) - Alarashi, Hala (Université Côte d'Azur, CEPAM, Nice)
Presentation Format: Oral

In 2018, an extraordinary child burial was discovered in a deep trench of the late Pre-Pottery Neolithic site of Ba'ja, in southern Jordan. Preliminary anthropological analyses have shown that an about 8 ± 2 yrs old girl was buried in this tomb. The burial is outstanding in several respects, not at least because of a necklace made of more than 2500 beads and a mother-of-pearl ring which served as a spacer of the chains. In our contribution, we will present some of the special objects, the burial ritual and the tomb construction in comparison to the other collective burials of the site but also to other child burials in the region. Our investigations show that the display of this infant in the cist grave abided – despite its elaborate grave construction and the complex necklace – to local traditions. By the meticulously choreographed burial ritual and the repetitive use of red and white materials and pigment for the grave construction as well as for the body and the jewellery, the burying community confirmed social belongings. The red-white necklace was interspaced only by a few turquoise and hematite beads. The exotic materials should probably symbolize the participation in regional networks. The deliberate, noisy destruction of thin white sandstone slabs for the grave cover must have created highly arousing moments of memory. Use-wear analyses will clarify whether the beads had been used for a long time or whether they had been made for the child. The meaning of the hermetic sealing of the grave might have had various different reasons. Ongoing anthropological analyses might show whether the special prestige and/or status of the child might have been due to special personal traits or to familial relationships with other individuals buried in the same area of the site.
- 2 FUNERARY TREATMENTS AND SOCIAL STATUS OF PERINATES IN CLASSIC KERMA PERIOD (SUDAN), THE 8B-51 NECROPOLIS OF SAÏ ISLAND (ACH CHAMALIYA)**
Author(s): Partiot, Caroline - Castex, Dominique (UMR 5199 PACEA, Bordeaux) - Guillon, Mark (Inrap; UMR 5199 PACEA, Bordeaux) - Maureille, Bruno (UMR 5199 PACEA, Bordeaux)
Presentation Format: Oral

Despite the studies dealing with burial practices on adults, a lack of information exists on funerary treatments and social status of perinates and children during the Sudanese antiquity. New study of the funerary treatments on the Classic Kerma 8B-51 necropolis, excavated between 1999 and 2001 on the Nile island of Saï and dedicated to very young children, provides an opportunity to contribute to this topic. The aim of our study was to explore the social status of infants who died around birth in the Sudanese society, relatively to the immature individuals who survived longer and to the treatment documented on adults. We used archaeoethanatomical and bioarcheological analysis as well as a Geographic Information System on the 62 immatures and 2 adults of the site. Following our results, all graves shared common characteristics, whatever the age at death was. For example, most of the immature individuals were in a relatively contracted position, most frequently placed on the right side, and often sometimes on the left side. However, differences of burial characteristics were seen according to age group. Individuals who died quickly soon after birth were offered slightly more varied treatments, but with constant particular care. Children aged two months and above were the only ones with wooden bed and amulets, like normal funerary devices documented for adult in Kerma Classic Period. Surprisingly, none of both contemporaneous adults of the necropolis were treated traditionally, leaving open the question of the significance of this deviant treatment against their own status in the group. Our results support the hypothesis of a specific status of individuals who died before being fully integrated in the Kerma society, providing a better understanding of this culture without writing system and new perspectives for further researches.
- 3 ARE THEY REALLY MISSING? NON-ADULT GRAVES OF THE RECENT PREHISTORY CENTRAL SPAIN: AN ARCHAEOLOGICAL AND BIOANTHROPOLOGICAL APPROACH**
Author(s): Herrero-Corral, Ana (Universidad Complutense de Madrid)
Presentation Format: Oral

Most of prehistoric funerary archaeology studies address the scarcity of non-adult individuals in relation to what it should be expected in pre-industrial societies, which have high infant and juvenile mortality rates. However they rarely explore its eventual causes and limits. For example, were babies the only missing members in cemeteries? Or did this underrepresentation also affect older children? Differential funerary treatment towards non-adults is another topic commonly approached by researchers. But, is this present in every age group? Are their burials really different compared to those of adults? And can we see in the funerary record at what time a boy or a girl is considered as an adult? To deal with those questions more than one hundred non-adult graves from the IIIrd-IInd Millennium BC in the interior of the Iberian Peninsula have been analyzed. This study, which includes both

archaeological (structures, grave goods, position of the body) and bioanthropological variables (age, sex, pathologies) seeks potential age-related funerary patterns and their differences with those of adults.

4 **WHERE DO THE CHILDREN GO? FUNERARY TREATMENTS OF JUVENILES WITHIN COLLECTIVE BURIAL SITES IN NEOLITHIC SOUTHERN FRANCE**

Author(s): Le Roy, Melie (Aix Marseille Univ, CNRS, LAMPEA, LabexMed)

Presentation Format: Oral

Collective burials are funerary deposits that accumulate over time with the regular or sequential addition of corpses. This phenomenon firstly took place in the European Atlantic coast around the middle Neolithic (4900-3500 BC) then it spread itself further in Europe towards the end of the Neolithic and during the beginning of the Bronze Age (3500-2000 BC). Some types of tombs (e.g. megalithic tombs) necessitated a huge investment of time and labor. According to ethnographic studies, these monumental tombs are generally built and managed either by a clan or lineage group (if it has enough members), or in collaboration with neighbouring tribes. We can hence ponder over who was buried inside these tombs, since some archaeological studies indicate that a specific burial practice may sometimes be restricted to certain members of the population. Indeed, ethnography highlights that access to some tombs may be structured by variables such as kinship, social status, etc. In this presentation, we will focus on the variable of age, which is often a cause for exclusion or segregation within the burial.

While existing studies that synthesise data from these monuments have paid a lot of attention to form and function, there has been less consideration of the nuanced differences noted in the deposition of human remains at these sites. Based on the methodology of the study of a collective burial site in Northern France, La Truie Pendue (Passy and Veron), a project was undertaken on several similar burials from the south of France. Burial sites were studied in order to define the population buried inside, be they caves or megalithic monuments, along with the study of the logic of the body deposition within the structure. Indeed, these studies often reveals special treatments (localisation, position, etc.) towards the youngest suggesting a different social status depending on the age-at-death.

5 **THE FIRST YOUNGSTERS OF A NEW AGE: JUVENILES IN THE NEOLITHIC OF HUNGARY**

Author(s): Anders, Alexandra (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)

Presentation Format: Oral

The presentation offers an overview of the graves containing juvenile burials from the 6th and 5th millennia BC in Hungary, a subject that was wholly absent from the discourse of earlier studies. Despite the assumed demographic profile of early agrarian populations, this age group is usually underrepresented in the prehistoric mortuary record, making it a genuine challenge to gather all the available mortuary data on them. Contextualising the life and afterlife of juveniles in the light of the latest results of bioarchaeological investigations will complement this information as well.

Can we detect any differences in the non-adult age distribution across different juvenile age ranges in lifestyle and mortuary rites? What are the reasons underlying the underrepresentation of juveniles? How were their bodies treated? Although juveniles did receive grave goods, their burials do not rank among the rich graves with a few notable exceptions. What kinds of situations are represented in the cases of lavishly furnished burials? Were the grave goods found in juvenile burials genuine personal belongings from this life or were they rather expressions of their fulfilled or prospected social status? Where were their burials deposited – together with the community of adults, or separate from them? Was age, especially young age, a structuring principle in the communities? What was the role of juveniles in Neolithic communities? Can we detect changes through the millennia, from the Early to the Late Neolithic, and in different regions of Hungary?

The project is financed by a grant from the National Research, Development and Innovation Fund Fund (Grant K124326).

6 **TRACING CHILDHOOD: BIOARCHAEOLOGICAL CASE STUDY FROM SOUTHERN TRANS-URALS**

Author(s): Sharapova, Svetlana (Institute of History and Archaeology, Urals Branch of RAS, Ekaterinburg) - Karapetian, Marina (Research Institute and Museum of Anthropology, Lomonosov MSU, Moscow)

Presentation Format: Oral

The archaeology of children is not just about children themselves but rather about the relationships children had with their environment, including family/adults connection. Thus the paper will deal with bioarchaeological investigation, which is being undertaken for Bronze Age steppe population of the Southern Trans-Urals with emphasis on studying subadults. Three kurgans (burial mounds) of various sizes were excavated by Russian-German team nearby Neplyevsky village in Chelyabinsk region. The excavation of kurgans was accompanied with field anthropological observation and special attention to taphonomy of intact skeletons as well as isolated bones found beyond burial chambers. All skeletal remains were examined for osteological and paleopathological changes. The recovered interments were modest in terms of grave-goods but were impressive by funeral expenditure as marked by rock-clay constructions. Small kurgans 5 and 9 yielded only 6 sub-adult skeletal remains; while the biggest kurgan 1 enclosed single and double burials of estimated 44 individuals attributed to different age categories with significant prevalence of children and juveniles. There is no any specifics of spatial organization for both adults and sub-adults graves found in the biggest kurgan. Although for children we discern notable diverse of pottery location, pictographs depicted on pots, etc. Small number of double and secondary burials was found among all age categories, i.e. pre-adult, prime adult and elder. The age profile of the subadult sample is in agreement with high infant mortality (0-2 years, about 30% of the total sample) which decreases gradually

being minimal at late childhood and juvenile stages. Such mortality rate is not unique but always of particular interest and induces various interpretations. This paper describes archaeological and anthropological evidence as well as contributes to general scholarship concerning archaeology of childhood by providing new bioarchaeological and contextual information.

This research was supported by RFBR (project 19-09-00354A).

7 THE DIFFERENTIATION OF THE FUNERAL RITES OF THE IMMATURE MEMBERS OF THE ENEOLITHIC SOCIETY. AN EXAMPLE FROM SOUTH POLAND

Author(s): Wilk, Stanislaw (Institute of Archaeology of the Jagiellonian University, Kraków) - Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Kraków; Department of Anatomy, Jagiellonian University Medical College, Kraków)

Presentation Format: Oral

The funeral rites of the immature individuals is one of the most interesting aspects of the burial research of Neolithic population. This is due to the fact, that in this period there were existed many different patterns of the proceeding with the immature dead. This is probably the result of the diversity in the social status of juveniles and their treatment in various religious systems. The perfect example of the social-religion changes, which took place in the area north of the Sudeten and Carpathians is the multi-cultural necropolis form Eneolithic and Early Bronze Age at site 2 in Książnice in southern Poland. Within a seventeen years of the regular archaeological excavations there were discovered several dozen burials belonged to the archaeological cultures dated from the early 4th to the beginning of the 2nd millennium BC. Many of these graves belonged to individuals at the age of Infans or Juvenis. The aim of our paper is to show the different customs connected with burial rites of immature individuals depending on the respected traditions. Our study include funeral customs of the Lublin-Volhynian culture which was the most northern enclave of the Carpathian Copper Age civilisation then communities of the Złota culture – the local syncretic group of the Globular Amphora culture as well as individuals of the Corded Ware culture from the second part of the 3rd millennium BC.

8 CHILDREN OF THE DUST JUVENILE CREMATION BURIALS IN THE LBA CEMETERY OF ZAGYVAPÁLFALVA, NORTH-EAST HUNGARY

Author(s): Guba, Szilvia (Ferenc Kubinyi Museum) - Köhler, Kitty (Hungarian Academy of Sciences, Archaeological Institute)

Presentation Format: Oral

The LBA cremation cemetery of Zagyvapálfalva has been known for more than 150 years. The first excavations were conducted in 1920-s revealing ca 250 graves. During our research in 2007-2008 another 815 cremation graves were recorded, with 846 cremated individuals. The cemetery was believed for decades to be dated to the Pilyi (Reinecke Bz B2 to Bz D) and Kyjatice cultures (Ha A-B). New investigations reveal a beginning already in the MBA (Reinecke Bz A3) and a smooth transition into the Late Bronze Age. Altogether 262 child burials were identified and with only one exception - all were cremated. Most of the children were buried in separate graves, but we could also document multiply burials (adults with child or child with child). Almost 75% of juveniles could be classified to the age groups of Infans I. and II. and Juvenis, while in 9% of all children graves were neonates. In 3 burials foetus were registered: two of them were buried together with an adult female.

Within the cemetery, a large variation of grave structures was recognised: stone coverings of graves, stone and earth structures, like tumuli. Also, placing the cremations, bronze artefacts, animal remains and other grave goods into the graves and vessels, create a complex puzzle to solve. Nevertheless, the burial rite as such is strict and follows specific rules, which were adapted even for children. In some cases though, slight differences could be noticed during the burial of juveniles.

In our presentation we would like to highlight some of the results of our investigations regarding grave type, grave accessories, urn type with the connection of the possible age of the buried child. The results are set into chronological framework and gives us the opportunity to examine changes in child burials, body treatments and child death during centuries.

9 CHILDREN WITHIN THE CONTEXT: FUNERAL RITES IN THE ETRUSCAN PO VALLEY

Author(s): Serra, Anna (University of Salerno)

Presentation Format: Oral

The study of infant funerary rituality had always encountered major problems in the Etruscan studies due to the difficulty to analyze data from old excavation, which normally preclude the possibility to study osteological remains. Moreover, literary sources provide little information about children and childhood in the Etruscan times, fact that had created an apparent invisibility of children both in the society and in the funerary studies. In order to overcome the problem, a new systematic study of some unpublished contexts found in the Etruscan Po Valley has been undertaken. These necropolises, dating to the late Iron Age, permit to contextualize the infant funerary rituality into a broader perspective within the Etruscan society. The study will reconstruct the funerary customs and the spatial distribution, comparing the children to the whole context. This new approach could retrieve the normative rites and, at the same time, bring to light the anomalies. The paper will focus mainly on the new strategies and approaches developed in the first stages of this research, trying to enlighten the problems and the achieved and predicted results.

10 SWEET CHILD O' MINE. FUNERARY REPRESENTATION OF INFANTS AND CHILDREN IN IRON AGE VENETO

Author(s): Bortolami, Fiorenza (Ca' Foscari University of Venice)

Presentation Format: Oral

In the last decades, the research in Veneto (North – Eastern Italy) has identified many burial grounds, especially crematory burials, dated from IX to III century B.C. The study of these contexts has concerned the reconstruction of individual identities (especially regarding gender, status and social role of the deceased) by chronological and typological analysis of findings and by the understanding of the funerary ritual. In this panorama, the knowledge of children burial is mainly due to two types of data: 1) osteological analysis, that clearly distinguish children's burials from those of adults, 2) study of the composition and organization of grave goods, that identify specific items often associated with infants (like characteristic urns, small objects, shells, astragalus etc). Based on the analysis of different contexts, it can be currently assumed that children's burials reflected different levels of complexity in the funerary representation: some graves seem to be complex and particularly elaborated, while others are simpler, others again are almost "invisible". These differences in archaeological visibility could represent different levels of status, rank and role of the deceased and his family and/or different ways of expressing lineage.

This paper aims to provide an overview of different funerary rituals and children's burials in Veneto during the Iron Age with an integrated multidisciplinary approach. By analysing specific burials as case studies, it will take in consideration all the different types of available data that consider differences in grave structures, ritual practices and composition of the grave goods.

The aim of this paper is to delineate patterns of funerary representation of children and related changes associated with social dynamics in a diachronic and geographical perspective.

11 BEYOND INHERITANCE. OSTENTATIOUS BURIALS OF CHILDREN IN THE EUROPEAN EARLY IRON AGES

Author(s): Schumann, Robert (University of Hamburg, Archaeological Institute) - Heilmann, Daniela (LMU München, Munich Graduate School for Ancient Studies)

Presentation Format: Oral

The last decades have witnessed a vivid discussion of children in archaeology, and they are now being investigated from different perspectives. For the early Iron Ages the natural focus is on burial archaeology, as the early Iron Age features ostentatious burials of children in different regions. In many cases, children's graves are/have been regarded as a separate category within cemetery analysis, but they can provide valuable information about the social framework of the entire burial community, as burial rituals offer possibilities to negotiate norms and values.

In German-speaking archaeology, discussions of these child burials are dominated by the interpretation that rich burials of sub-adult individuals indicate the hereditary nature of social status depicted in the burial rituals. As such, these children are linked to questions of social and political structures and seem to indicate dynastic systems. Naturally this is only one facet of the possible interpretations and explanations of such burials and in this paper we want to discuss different possibilities to interpret rich child burials of the early Iron Ages beyond inheritance. We will present case studies from Central Europe, Italy and the Balkans to illustrate the diversity of these burials and the associated discussions.

12 THE IRON AGE RICH KID: NON-ADULT ELITE GRAVES AS A MARKER FOR DUTCH MIDDLE IRON AGE SOCIAL STRATIGRAPHY IN OSS-IJSSELSTRAAT

Author(s): Veselka, Barbara (Free University of Brussels, Belgium; Leiden University, the Netherlands) - Jansen, Richard (Leiden University, the Netherlands)

Presentation Format: Oral

The partial abandonment of traditional urnfields can be observed in large parts of Germany, Belgium and the Netherlands in the Middle Iron Age (MIA; c. 525 – 275 BC). While extended urnfields and rich 'chieftain' graves dominate the Early Iron Age (EIA; c. 650 – 525 BC), MIA cemeteries become smaller in size whereby graves become less monumental, contain fewer grave goods, and urns become scarce. The site of Oss-IJsselstraat contained 26 cremation graves that could be dated to the MIA. The majority of the graves contained sherds and/or animal bone (14/20; 70.0%), and four graves yielded an urn. Two graves contained grave goods that are considered to represent elite status: grave 3 an iron torque and grave 4 a burnt bronze torque and a burnt iron knife. Both graves were surrounded by square ditches and were positioned against each other in the center of the cemetery. Osteoarchaeological analysis showed that at least 23 individuals were buried in Oss-IJsselstraat, and that the majority of individuals was adult (19/23; 82.6%). Two non-adult individuals, one aged 4 – 6 years and one aged 7 – 12 years, were buried together in an urn. Age-at-death of the individual with the iron torque is estimated to have been between 7 and 12 years of age. This 'rich kid' grave is exceptional because elite graves from the EIA can almost without exception be ascribed to adult men. This paper shows the importance of combining archaeological data with osteoarchaeological analysis to identify funerary rituals and individuals with an elite identity to improve our understanding of the social stratigraphy of MIA Oss-IJsselstraat.

- 13 BURYING CHILDREN DURING LATE IRON AGE: THE NECROPOLIS OF URVILLE-NACQUEVILLE, NORMANDY (FRANCE), SECOND CENTURY BC**
- Author(s):** Arzelier, Ana (De la Préhistoire à l'Actuel, Culture, Environnement, Anthropologie-UMR 5199, CNRS, Université de Bordeaux) - Partiot, Caroline (De la Préhistoire à l'Actuel, Culture, Environnement, Anthropologie-UMR 5199, CNRS, Université de Bordeaux) - Fischer, Claire-Elise (De la Préhistoire à l'Actuel, Culture, Environnement, Anthropologie-UMR 5199, CNRS, Université de Bordeaux) - Lefort, Anthony (Inrap Grand-Ouest) - LeRoy, Mélie (Aix Marseille Univ, CNRS, LAMPEA, LabexMed) - Rottier, Stéphane (De la Préhistoire à l'Actuel, Culture, Environnement, Anthropologie-UMR 5199, CNRS, Université de Bordeaux)
- Presentation Format:** Oral
- Ten kilometers west from Cherbourg, Normandy, the shore of Urville-Nacqueville houses a major Iron Age necropolis of the second century BC. The excavations ended in 2017 and revealed more than a hundred graves, comprising of about sixty of particularly well-preserved immature individuals, from various age groups.
- This site is of special importance for the understanding of funerary practices in this region and the place of juveniles in funerary rituals. Since 2011, the necropolis is at the core of an interdisciplinary research program, confronting DNA studies, biological characterization of the deceased and GIS.
- The present work aims to assess the identity of the deceased using an osteobiographical approach on a corpus composed by 59 individuals. A second objective is to question the different treatments observed and therefore provide insight into the funerary practices used by this coastal iron age group and the principles underlying immature funerary rituals.
- Indeed, the excavations document the existence of a funerary organisation specific to immature individuals. If age-at-death does not regulate access to the necropolis, this criterion governs the processing of the body after death. Inhumation appears to be devoted to individuals under the age of ten years old, a limit above which the deceased experienced a different treatment, namely cremation.
- If we consider adults funerary practices to be the normative organisation, the sepulchral sphere dedicated to those under 10 years old lies outside the funerary conventions associated to usual rituals. Fire treatment appears to be restricted to "adults", however children funerary practices are also governed by conventions, regulating the choice of spatial and internal organisations of the burials. The installation procedure of a burial is regulated by both the funerary functioning of the necropolis and age at death. Thus, what transpires from the practices observed at Urville-Nacqueville is likely an evolution of status during childhood.
- 14 INFANTS IN WELLS AT ERETRIA, EUBOIA AND THE ATHENIAN AGORA: DEVIANT OR NORMATIVE BURIAL PRACTICE?**
- Author(s):** Liston, Maria (University of Waterloo)
- Presentation Format:** Oral
- The deposition of bodies in abandoned wells has often been considered a deviant burial practice, yet it is a common finding in excavations across the Greek world. Large numbers of infant remains in wells have in the past been viewed as potential evidence of troubling practices such as infanticide or human sacrifice. However recent publications of wells in the Athenian Agora (Liston, Rotroff, and Snyder 2018) and Messene (Bourbou and Themelis 2010) suggest that these sensational interpretations are unlikely and natural infant deaths should be considered in most cases. Recent analyses of human remains from wells in Eretria, Euböia suggests that this burial practice is more common than has been recognized. A well excavated in 2016-2017 contains at least fifty infant remains deposited in the Late Roman period. Here again, the age profiles and evidence of pathology suggest the deaths of many of the infants are from natural causes. At least two additional wells in the Athenian Agora and one in Eretria have smaller numbers of infant skeletons too. In at least three of Agora and Eretria wells, large numbers of dog skeletons intermixed with the infant bones indicate that sacrifices probably accompanied the deposition of the infant bodies, or were conducted in the same location, suggesting some sort of ritual behaviour, not simply expedient disposal of the dead. The evidence suggests that depositions in wells were a common method of burial for infants who died at or near the time of birth, and the practice should perhaps be considered a normative, if perhaps somewhat marginalized, process, rather than deviant behaviour.
- 15 ROMAN NON-ADULT CREMATIONS FROM BELGIUM: AN OSTEOLOGICAL PERSPECTIVE.**
- Author(s):** Hlad, Marta - Veselka, Barbara - Stamataki, Elisavet (Maritime Cultures Research Institute, Department of Art Sciences & Archaeology, Vrije Universiteit Brussel) - Sabaux, Charlotte (Department of Archaeology, Ghent University) - Sengeløv, Amanda (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - De Mulder, Guy (Department of Archaeology, Ghent University) - Vercauteren, Martine (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Boudin, Mathieu (Royal Institute for Cultural Heritage, Brussels) - Snoeck, Christophe (Analytical, Environmental & Geo-Chemistry, Department of Chemistry, Vrije Universiteit Brussel; G-Time Laboratory, Université Libre de Bruxelles) - Tys, Dries (Maritime Cultures Research Institute, Department of Art Sciences & Archaeology, Vrije Universiteit Brussel)
- Presentation Format:** Oral
- Written sources from the Roman period provide information on how children were treated in Roman society and how this perception was reflected in funerary practices. However, there are very few written sources discussing funerary rituals from the provinces (such as Belgium). Most of these sources report on the lifestyles of the elites and discuss daily life in ancient Rome

and other Italian cities from that period.

This paper presents the results of the osteoarchaeological analyses of Roman non-adult cremations from four Belgian sites and discusses the results in the broader context of Northwestern Europe. The focus of the analysis is on discerning differences and variations in funerary practices between children from different socioeconomical classes, difference between adult and non-adult burial rituals, as well as understanding patterns in spatial organization of non-adult burials. The aim is also to compare non-adult funerary practices of the provinces to that of the main Roman cities. In order to improve our understanding of funerary rites for non-adults, a combination of osteoarchaeological evaluation, archaeological data and written sources is used. This will add to a better understanding of the "rite de passage" towards the tragic passing of the young from a comparative perspective. This research is part of the CRUMBEL project (Cremation, Urns and Mobility in Belgium).

16 FUNERARY RITUALS MOTION FOR JUVENILES IN GAUL. SPECIFICITIES AND STANDARDS OF INFANT BURIALS IN AVARICUM FROM 1ST TO 5TH CENTURY

Author(s): Durand, Raphaël (Service d'archéologie préventive Bourges Plus)

Presentation Format: Oral

During Antiquity, and more particularly the Roman period, the specificities of funeral practices related to the death of children are extensively documented, especially for the youngest, i.e. those who died before one year old. Indeed, under the term "child" are grouped together distinct realities in which are associated the very young child who does not yet have a societal identity and the biological immature who has the status of a social adult.

Whether it is the ancient discoveries or the recent excavations, Avaricum (Bourges, France) has so far delivered a large corpus of burials of children dated from the early Roman Empire at the end of late Antiquity. Although those burials respect the localisation and organization characteristics usually recognized in Roman Gaul, it nevertheless underlines the diversity of gestures devoted to children. From graves in domestic settings, outside community graveyards, to sarcophagus burials inside funerary buildings settle in the main urban necropolis, the contexts of discovery and the organization of burials vary significantly in time and space.

Beyond funerary perspectives, data from forensic archaeology put into perspective with historical sources indicate that those developments keep pace of structural, social and ideological transformations known from the 1st to the end of the 5th century in the capital of Biturigi Cubii. Based on various significant examples, this presentation will focus on illustrating those changes, which are directly related to the place it occurs, rural area or urban area, to the populations that carry it out and the context in which it takes place.

17 MORS ACERBA INTO THE CIVITAS OF FORUM IULII (NARBONNENSIS GAUL): FROM ARCHAEOETHANOLOGY TO SOCIAL ARCHAEOLOGY

Author(s): Lattard, Alexia (Centre Camille Jullian CCJ, Aix-en-Provence; Laboratoire d'Anthropologie bioculturelle - ADES, Marseille) - Schmitt, Aurore (Laboratoire d'Anthropologie bioculturelle - ADES, Marseille)

Presentation Format: Oral

This study presents a synthesis of the funeral practices for immature individuals during the High Empire. The originality lies in the choice of a micro-regional approach, here an administrative and legal territory well defined in Antiquity: the civitas of Forum Iulii (Fréjus, Provence, France). In the main city (Forum Iulii) or secondary town (Forum Voconii) of this territory, the funeral spaces, excavated between 1980 and 2008, provide a corpus of 103 exhumed tombs dated between the end of the first century BC and the beginning of the 4th century AD.

The aim is to understand the funeral structures dedicated to immature individuals, through the different contexts which are associated with these burials. Thus, we question, through funeral practices, the perception and place of the death of these immature individuals in Roman societies. Indeed, the funeral practices specific to these young subjects are the result of choices made in the family intimacy; they place the deceased in a new context, the otherness of death reminding society of the deceased's place in the realm of childhood.

The graves analysed, comprising cremations or inhumations, testify to specific gestures towards them; the inter-site comparative analysis reveals heterogeneity in the practices. Despite the sharing of a common standard in the constitution of the tomb throughout this territory, the archaeological data and the renewal of problematics associated with methodological progress in Archaeoethanatology, allows us to interpret this variability better. This diversity of situations, both in deposits and devices, highlights specific treatments depending on the social group to which they are linked. This new reading proposes the first answers on the origin and the identification of the populations present on the territory of this civitas.

18 A CHILDHOOD CUT SHORT?: A BIOARCHAEOLOGICAL ANALYSIS OF JUVENILE DECAPITATION BURIALS IN LATE WESTERN ROMAN BRITAIN

Author(s): Christie, Shaheen (University of Wisconsin-Milwaukee)

Presentation Format: Oral

Archaeological investigations of Romano-British burials have revealed diverse forms of normative and non-normative burial treatments and attitudes toward the dead. Decapitation burials are perhaps the most common form of differential burial with interpretations ranging from infanticide, execution, trophy taking, fear of the dead, and veneration. Interestingly, large scale

studies have found evidence for decapitation of individuals of all ages, sex, origin, health, stature, etc. making it difficult to determine in most cases a contextual explanation for the application of the rite. Bioarchaeological analysis of Late Roman Period (3rd – 5th cent. A.D.) decapitation burials in central and southern Britain revealed a continuation of Late Iron Age (100 B.C. – A.D. 43) fragmentation rites, namely intentional breaking and scattering of human or animal remains in burials or deposits. Interpretations for those burials suggest decapitation burials of both adults and juveniles were part of a sub-class of mortuary treatment in the region used to mark communal membership rather than a deviant identity of the dead. However, was this also the case in the western region of the country? This project will use mortuary and bioarchaeological data from eight juvenile decapitation burials in Gloucestershire and Oxfordshire in western Britain and compare those data to: 1) decapitated adults in the same sites, 2) non-decapitated population in the same sites, and, 3) decapitated juveniles in central and southern Britain in order to determine if those funerary rituals are structurally different or similar in specific contexts. It is hoped by utilizing a systemic approach to this analysis that the results will reveal whether there is evidence to suggest communities utilized specialized mortuary rituals toward decapitated juveniles, whether those practices may be classified as normative, atypical, or deviant, and whether juvenile bodies were used as objects to culturally construct expressions of communal identity in Late Roman society.

19 THE LATE ANTIQUITY BURIALS OF VERDIER NORD IN LUNEL-VIEL (FRANCE, HÉRAULT), GRAVES ON THE OUTSKIRTS OF THE NECROPOLIS

Author(s): Djouad, Sélim (Hadès; TRACES - UMR 5608) - Chen, Agathe (Hadès)

Presentation Format: Oral

The township of Lunel-Viel, located in the south of France, has benefited for over 35 years from numerous archaeological researches. In 1985 and 1986, Claude Raynaud's works have led to unearth a large necropolis used since the end of the IIIrd century until the VIth century, a necropolis which presents the exceptional character to have been completely excavated.

In 2014, a rescue archeology operation, carried out on the locality of Verdier Nord, located on the outskirts of the nearby necropolis, completes the already acquired data. It highlights an occupation with two principal modes of exploitation: a vineyard from the High Empire and a rural exploitation linked to a craft production in the period of the Lower Empire. Indeed, during the late Antiquity (between the IVth and the VIth century) the rural development amplified, extended the territory and organized the occupation according to a fragmented division. On pre-existing bases, a set of ditches was set up to surround and partition agricultural buildings and installations.

It is within this first unit of exploitation identified in Lunel-Viel that 19 burials were discovered in agrarian context. Apart from any overall structuring, a large majority of these tombs share the common characteristic of being located near a ditched structure, sometimes in a strategic layout: at angles or at ends of ditches. They systematically harbor very young children, immature individuals less than 2 years old, or even perinatal individuals. The funerary architecture is variable but always neat.

The location of these burials seems quite significant. Stratigraphy shows that ditches were still visible in the landscape of the late Antiquity through probable plant, lithic or ceramic markers. Given their location, it is the status of these immature funerary deposits that questions. Outside the nearby and contemporary necropolis where people of the same age find their place.

20 THE BAPTISED AND THE UNBAPTISED – ENTWINED MOTHERS AND INFANTS, BODIES AND SOULS

Author(s): Murphy, Eileen (Archaeology & Palaeoecology, School of Natural & Built Environment, Queen's University Belfast)

Presentation Format: Oral

A common thread through historical accounts cross-culturally, spatially and temporally is that pregnancy was often a happy event that gave hope for the future but was also a time of fear and concern for the safety of the mother and child, both of whom were considered at risk of death. The juxtaposition of bringing forth new life and potential loss of life elicited a complex range of emotions and theological considerations. Early Christian doctrine spearheaded by St Augustine of Hippo (AD 354-430) held the view that unbaptised souls could not enter heaven so how did this impact upon pregnant women and their unborn babies – entwined souls of the baptised and unbaptised? The paper will review evidence from sites spanning the Early Medieval to Post Medieval periods in Ireland to see what the archaeological evidence reveals. The data set includes the burials of women and their unborn babies from both consecrated burial grounds and the later unconsecrated cillíní to see if differences in the frequencies of such pairings are evident across these sites. The nature of the funerary rituals afforded to the mothers and babies will also be investigated to gain insights in relation to contemporary attitudes to maternal-infant deaths.

21 THEORETICAL CONTEXT, SYSTEMIC APPROACH PROPOSAL AND APPLICATION FOR THE STUDY OF FOETUSES, STILLBORN, BABIES FROM THE CEMETERY OF SAINT AYOUL

Author(s): Guillon, Mark (Inrap; UMR 5199 PACEA Bordeaux University) - Partiot, Caroline (UMR 5199 PACEA Bordeaux University) - Portat, Emilie (Direction de l'archéologie - Chartres, France; UMR 7041 ArScAn Paris)

Presentation Format: Oral

This paper leads a reflection about how far we can go in comparing results from excavation and field data on the one hand and from biological study of human remains on the other. First of all, one must establish how precise data must be on each hand. Considering that results must be as reliable as possible, data must be as precise as possible, but very different factors can threaten this precision: taphonomy, available time, field and lab methods, sample size, sample representation etc. In which conditions are we able to characterize a population through an excavated buried sample of individuals, what further information can we reach in

crossing data? What tools can we expect to obtain gathering data from both field and lab and what is their reliability?

We shall first consider the problematics in their theoretical context, then present a systemic approach organised by levels. The second part is an application through an archaeological case, with the study of stillborn, fetuses and babies from Saint Ayoul parish cemetery, near Paris. We cross practises during life (babies wrapped up) and after death (specialized cemetery area, coffins, shroud, ...), biological data (age at death, pathologies, anatomical variability) and written sources (iconography, parish registers, ...) to characterise particular behaviours in live and death of the little ones.

22 JUVENILE SOCIAL AGE PHASES IN POST-MEDIEVAL FINLAND: BIOLOGICAL REALITIES, SOCIAL EXPECTATIONS, AND CULTURAL CONTEXTS

Author(s): Lipkin, Sanna (University of Oulu) - Tuovinen, Saara (University of Oulu)

Presentation Format: Oral

Between the 17th and 19th centuries being a child was rough in Finland. Life expectancy was not high and one most likely lost a sibling or more. Northern Finnish funerary materials from five sites consists of circa 120 juvenile burials of individuals younger than 12 years old, and provide possibilities to consider age phases, how they may be differentiated based on archaeological contexts, and how they correlate the social and cultural realities. Stillborn (at fetal stage), newborn, and infant burials, outnumber older child burials, which is both a cultural and biological phenomenon caused by burial customs and high infant mortality rates. Compared to burials of older children, these burials represent also a wider spectrum of practices with local variations, some of which may be considered atypical. For instance, few newborns were hidden inside adult coffins next to feet. Nevertheless, all burials show signs of care, and older child burials provide evidence for increased emotional attachment. The preparatory funerary rituals consisted of carving the coffin, lining it with white textiles, making clothes for the child, and dressing the child for burial. According to written sources, these different actions were conducted by adolescents of both genders (making) and fearless women (dressing). Because many Finnish burials are exceptionally preserved (soft tissues, names inside coffins, intact textiles), gender of the children may be discussed: the burials provide polarized conception of gender identities. However, some adolescent or young adult burials indicate that biological identifications of sex and cultural identifications of gender do not always match. Foremost, the archaeologically visible choices made by the coffin makers and dressers were closely related to beliefs and conceptions of death, and it will be examined how these beliefs were reflected on the burials of Finnish juveniles of different age phases from stillborn to adolescent.

A. NEOLITHIC POT BURIALS FROM KHOR SHAMBAT, SUDAN

Author(s): Jórdeczka, Maciej (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Chłodnicki, Marek (Archaeological Museum Poznań) - Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Stanaszek, Łukasz (Anthropological Laboratory, State Archaeological Museum) - Bobrowski, Przemysław (Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Poster

One of the most intriguing funeral practices which had earlier been described only at three Neolithic sites in Sudan are burials in ceramic vessels. The tradition had been rather widely common in prehistoric times, and the oldest examples probably originate from the North Levant (end of the 7th millennium BC). Neolithization came to Sudan from the north, probably as an entire packet of changes, not only economic. These were clearly reflected in funeral practices as well, which had undergone a radical metamorphosis, while substantial changes in the rituals are a clear sign of a change in beliefs and social organization. What is interesting, in Sudan pot burials have a slightly older chronology than in Egypt. Yet another matter is the role of the vessels themselves as funerary containers. Some researchers believe that they had been deliberately selected and reused, which was dictated by a variety of reasons - pragmatic, as well as symbolic (e.g. relation between vessels and wombs and eggs, the Egyptian symbols of life). Four graves had been investigated in Khor Shambat. Found in a trench with an area of 4 m², were Early Neolithic fetuses and infant pot burials with relatively abundant burial goods. The vessel type ceramics, as well as the radiocarbon date, suggest a chronology of around 4300-4100 cal BC.

This work was supported by the National Science Centre, Poland under Grant no. 2015/17/D/HS3/01492.

B. AXE IN THE IRON AGE CHILD BURIALS (7TH -12TH CENTURY AD) IN THE TERRITORY OF LATVIA: GENDER, SEX OR STATUS

Author(s): Erkske, Aija - Vilcāne, Antonija - Pētersone - Gordina, Elīna (Institute of Latvian History at the University of Latvia) - Kazarina, Alisa - Ķīmsis, Jānis - Ranka, Renāte (Latvian Biomedical Research and Study Center) - Gerhards, Guntis (Institute of Latvian History at the University of Latvia)

Presentation Format: Poster

Axe was used both as a tool and a weapon in Iron Age Latvia, and it had a particular role in burial traditions. It has mainly been found in male burials, and very rarely in female burials. Although axe is usually associated with adult burials, it has sometimes been found in burials of children of different age groups. This particularly applies to axes with shafts wound with ornamented bronze bands. In literature, graves furnished with these axes have been interpreted as rich warrior burials, but the same type of axes have also been found in a juvenile (3-4 years old) and an adolescent (10-12 years old) burial. The axes found in these child burials did not differ in size or shape from those found in adult burials. It is not entirely clear what factors were behind placing this kind

of axe in child burials, and whether gender, sex and status were among them.

This research has applied an innovative approach in studying burial traditions, using biomolecular (DNA) and biochemical (isotope) methods alongside archaeological and bioarchaeological methods. In this study, ancient DNA was used to establish biological sex and kinship, and stable isotope analysis was used to observe differences in diet between individuals of various age categories and with different grave furnishings.

The results of this research provide new information about approaches to gender identity and social status in Iron Age Latvia through burial traditions and help to interpret the role of children in prehistoric populations.

This research was a part of the Latvian Council of Science project No Izp-2018/1-0395.

C. TWO DEVIANT SUBADULT BURIALS AT THE ČUNKĀNI - DREŅĒRI CEMETERY (8TH -11TH C.) IN THE TERRITORY OF LATVIA

Author(s): Erkske, Aija (Institute of Latvian History at the University of Latvia)

Presentation Format: Poster

Čunkāni – Dreņģeri cemetery was used during Latvian Middle (5th – 9th c.) and Late (9th – 12th c.) Iron Age by a local tribe – Semigallians. There are 743 inhumations burials excavated (which is only a small part of the probable territory of cemetery), where both adults and subadults were buried in regular rows according to the same burial traditions – oriented mostly to the NW or SE and accompanied with grave goods, like ornaments, tools and weapons. Although the majority of the dead were placed next to each other in regular rows, there are some exceptions where burials' location is different. Two of these deviant burials were of young children (burials No. 84 and 89), 2-5-years-of-age. Both burials were located at the bottom of the row, at the feet of several other subadults and young adults burials, oriented perpendicular to them. Although both subadults were of similar age and their burials' deviant location were identical, there were differences within their grave good set – burial No. 84 contained no grave goods, on the other hand, subadult that was placed within burial No. 89 were given both tools and ornaments, according to the female grave goods set tradition. It is unclear why these two burials were placed in this unusual location – there are numerous young children, both with and without grave goods across the cemetery, that are located next to the adults in the same manner, so why these particular subadults are treated differently? It can be argued that deviant location could be related to the children different social status, some unusual burial tradition or just simple – economy of space.

This research is carried out within a project of Latvian Council of Science No. Izp-2018/1-0395.

D. AN UNUSUAL DOCUMENTED BURIAL OF A TEN-YEAR-OLD BOY IN THE CONTEXT OF THE END OF THE FIRST WORLD WAR

Author(s): Cvrcek, Jan (Department of Anthropology, National Museum in Prague; Department of Anthropology and Human Genetics, Faculty of Science, Charles University) - Kaupová, Sylva (Department of Anthropology, National Museum in Prague) - Půtová, Lenka (Department of Anthropology, National Museum in Prague; Institute for History of Medicine and Foreign Languages, First Faculty of Medicine, Charles University) - Velemínský, Petr (Department of Anthropology, National Museum in Prague) - Brůžek, Jaroslav (Department of Anthropology and Human Genetics, Faculty of Science, Charles University)

Presentation Format: Poster

During the reconstruction and research of the tomb of the family of landowners from the 18th to 20th centuries in Vetlá cemetery, Czech Republic, an unusual burial of a child was also discovered. It is a ten-year-old boy (1907 – 1917), and based on historical medical records, he died in hospital of inflammation of the appendix. Even postoperative drains were found. The presence of some skeletal non-metric traits that also occur in other family members supports his identity, the skeletal age estimation corresponds with the known data. Stable isotopes of nitrogen and carbon were also analyzed. The boy was atypically buried in a big double metal coffin for an adult, therefore the circumstances of the funeral were further analyzed. Both coffins were tightly closed, the body was covered with wreaths of Buxus. The presence of the inner coffin (inset) with small window can be explained by the hygienic regulations that were valid at that time. Its use was necessary, because the body was transported for a longer distance. However, there are unusual differences between outer and inner coffins: 1) The inner coffin is intact, and smaller. A short plank was found between the coffins to prevent movement of the inner coffin, so their mismatch was reflected at the funeral. 2) There are remains of sawdust and plant residues among the coffins. 3) The outer coffin is damaged in several places, and deformed outward. All these findings show that the outer coffin was used secondarily for this funeral. In the context of the economically consequences of the First World War in Czech lands (e.g., lack of goods, high prices, hunger), this mode of funeral reflects a compromise between compliance with the official regulations and the financial possibilities of the family, who is trying to provide a dignified funeral at the time.

81 FROM MICRO- TO MACROSCALE: IT'S ALL A MATTER OF PERSPECTIVE

Theme: Archaeological theory and methods beyond paradigms

Organisers: Brönnimann, David (University of Basel) - Shillito, Lisa-Marie (Newcastle University) - Rentzel, Philippe - Pümpin, Christine - Ismail-Meyer, Kristin (University of Basel)

Format: Regular session

Many archaeological research projects today are interdisciplinary and combine different research traditions, questions, per-

spectives, and types of data. Such approaches are indispensable when answering complex questions; however, they also necessitate a complex working practice. Combining and correlating the results from various disciplines as well as representing them appropriately can be especially challenging.

How to overcome these challenges of combining different scales and kinds of data is a major point for discussion, particularly in micromorphology. Apart from characterising anthropogenic and natural sediments in a detailed manner, micromorphology can also add to our understanding of formation processes and human activities as well as of taphonomic phenomena. This micro-scale research provides unique insights that are not possible using other methods. However, are such observations, which are usually based on a thin section of only a few square centimetres, really representative for an entire layer, profile or even for a whole site? More generally, how can data that has been gained at a micro-scale be transposed onto a meso- or macro-scale, and how can results originating from different disciplines be correlated?

This session will serve as a forum for (geo-) archaeologists with the focus being on how to deal with our own results and how to relate them to other scales and disciplines. The main questions for this session are:

- How can data that were generated at a micro-scale be transposed onto other scales?
- Which methods can be combined in a meaningful way?
- What kind of format should our data be so that it can be related to other types of data and data qualities in the most advantageous manner?

For, what applies to normal everyday problems also applies to (archaeological) research: it's all a question of perspective.

ABSTRACTS

1 FROM MICRO- TO MACROSCALE: INTRODUCTION

Author(s): Brönnimann, David (Integrative Prehistory and Archeological Science - IPAS, University of Basel; Archäologische Bodenforschung des Kantons Basel-Stadt) - Shillito, Lisa-Marie (School of History, Classics and Archaeology, Newcastle University) - Lo Russo, Sarah - Pümpin, Christine - Ismail-Meyer, Kristin - Rentzel, Philippe (Prehistory and Archaeological Science - IPAS, University of Basel)

Presentation Format: Oral

Many archaeological research projects today are interdisciplinary and combine different research traditions, questions, perspectives, and types of data. Such an approach is indispensable when answering complex questions; however, it also necessitates a complex working practice. Combining and correlating the results from various disciplines as well as representing them appropriately can be especially challenging.

How to overcome these challenges of combining different scales and kinds of data is a major point for discussion. Research at the micro-scale like soil micromorphology, phytolith analysis or palynology provides unique insights into archaeological sites or landscape archives. However, such observations usually are based on samples of a few square centimetres. But are they really representative for an entire layer, profile or even for a whole site or landscape? More generally, how can data that has been gained at a microscale be transposed onto a meso- or even macroscale, and how can results originating from different disciplines be correlated?

This introductory lecture gives an overview of the topic and the questions of the session.

2 THE SETTLEMENT OF TURGANIK IN THE CIS-URALS, RUSSIA: PALEOPEDOLOGICAL AND MICROMORPHOLOGICAL EVIDENCES OF PALEOENVIRONMENTS DURING THE SECOND PART OF HOLOCENE

Author(s): Khokhlova, Olga (Institute of Physicochemical and Biological Problems in Soil Science, RAS)

Presentation Format: Oral

The multi-layered settlement of Turganik in the Tok River valley (steppe region of the Cis-Urals) has been studied using archaeological, paleopedological, paleobotanical methods and radiocarbon dating. Place of settlement was occupied repeatedly. Three main periods of occupation were distinguished: the developed Eneolithic (first half of fifth millennium BC), the late Eneolithic (second half of fifth millennium BC) and the Early Bronze Age (the second and third quarters of the fourth millennium BC). The cultural layers attributable to the Atlantic period of the Holocene developed under conditions of a rather dry climate with domination of grass-forb vegetation with a small proportion of tree species. The settlement area was above the flood water level and was suitable for habitation. Micromorphological analysis shows that the fine material in the cultural layers is clayey-calcareous. The carbonates with clay are overlain with clayey-ferruginous material. Some fragments of calcareous shells are also quite distinct in the overlying material. Evidently, that was a case of two-phase formation of the fine material in the cultural layers. The Subboreal and Subatlantic periods were more humid and cool in whole. In the spore-pollen spectra the proportion of tree species increased, in the phytolith spectra the meadow cereal phytoliths prevailed. Micromorphology shows that fine material in the latest layers of the settlement is completely free of carbonates, clayey-Fe in composition, and mottled with spots and nodules of iron compounds. Such microstructure is typical of medium (not superficial) horizons of Meadow Chernozems (Stagnic Chernozems) that develop under conditions of a leaching water regime. For the studied settlement it means that floods became regular, people could not live for a long time in this place.

This work was supported by the state program N AAAA-A18-118013190175-5. Micromorphological analysis was carried out with the support of the RSF project, №19-18-00327.

3 **CONTROLLING CHRONOLOGY: U-TH DATING OF SILICA SPELEOTHEMS AS A MEANS OF EVALUATING SHORE DISPLACEMENT DATING OF ROCK PAINTINGS IN FINLAND**

Author(s): Lahelma, Antti - Kailamäki, Uine (Department of Cultures, University of Helsinki)

Presentation Format: Oral

Dating prehistoric rock paintings in Finland has traditionally relied exclusively on macroscopic analysis, such as spatial association with datable residential sites or geological dating based on shore displacement. Because most of the rock painting sites are on lakeshore cliffs, the post-glacial rebound and tilting of the Fennoscandian landmass enables a rough dating based on the current height above water of the painted panels. The current consensus is that the oldest paintings date from ca. 5200 calBC and the tradition gradually comes to an end around 1500 calBC. However, shore displacement dating of rock art is riddled with uncertainties, part related to insufficient understanding of the complex hydrological history of the lake systems, part intrinsic to the method itself.

In this paper, we examine the potentials of microscopic analysis – and specifically uranium-thorium dating – of the silica speleothems covering the art for resolving uncertainties related to macroscopic dating methods. We took samples from two rock painting sites from different parts of the country: one from the Lake Saimaa reservoir, where cross-dating with shore displacement chronology is possible, and one from the north-eastern part of the country where geological dating methods cannot be applied. We explore the feasibility of laser ablation mass spectrometry to make use of these sub-millimetre thick silica deposits in archaeological samples. We also analyse the pigment itself for signs of excess uranium, thus possibly offering additional data to incorporate in the dating process. The sample material contains both coralloid and smooth types of silica deposit. In addition to exploring the dating of the sites, we also aim to characterize the composition of the pigment in order to distinguish anthropogenic red pigment from natural iron oxides.

4 **A PILE DWELLING IN DEEP WATER? COMBINED MICROMORPHOLOGICAL AND MACROSCOPIC OBSERVATIONS FROM A NEOLITHIC SITE (CHAM-BACHGRABEN, SWITZERLAND)**

Author(s): Pümpin, Christine - Ismail-Meyer, Kristin (Integrative Prehistory and Archaeological Science - IPAS, University of Basel) - de Capitani, Annick (Amt für Denkmalpflege und Archäologie, Kanton Zug) - Rentzel, Philippe (Integrative Prehistory and Archaeological Science - IPAS, University of Basel) - Schaeren, Gishan (Amt für Denkmalpflege und Archäologie, Kanton Zug)

Presentation Format: Oral

From 2009 to 2013, the Neolithic lakeshore settlement of Cham-Bachgraben (Switzerland) on the shore of modern-day Lake Zug was excavated over an area of 4000 m². In the best-preserved sector below a street built in 1540 AD, several settlement layers were uncovered and large profiles documented: From 3124 to 1600 BC, the site was occupied during the so-called Horgen and the Schnurkeramik (Corded Ware) period, as well as during the Early Bronze Age. Adjacent to the historical street, a reduction layer was present including findings from all three periods. Some of the better-preserved settlement layers were rich in charcoals and ceramics, others in stones or loam lenses. The characteristic organic-rich layers, well-known from many lakeshore settlements, were missing. This arose the pivotal question for micromorphological analyses: Did the drainage of the lake of 1591/92 AD induce an aerobic degradation of organic rich layers? Further, the formation process of the reduction layer was another important issue.

The micromorphological study comprised the analysis of 59 profile columns including the natural sediments above and below the settlement layers. In some layers the alteration of organic material occurred during synsedimentary processes, indicating a (semi-) terrestrial depositional environment and challenging the idea that Cham-Bachgraben was in fact a classical lakeshore settlement, comparable to e.g. Zürich-Parkhaus Opéra (ZH) or Zug-Riedmatt (ZG). For the investigation of the reduction layer, micromorphological observations were insufficient and a macroscopic approach was needed in order to shed light on the site formation process.

5 **SUGAR PRODUCTION IN THE NORTHERN ISRAEL COASTAL PLAIN: CERAMIC TYPOLOGY AND PROVENANCE STUDIES**

Author(s): Shapiro, Anastasia - Stern, Edna - Getzov, Nimrod (Israel Antiquities Authority) - Waksman, Sylvie (CNRS)

Presentation Format: Oral

Archaeological excavations and surveys at several sites in the coastal plain of northern Israel revealed evidence of sugar production dating from the eleventh to the seventeenth centuries. Three of the sites were subject to a multidisciplinary study within the POMEDOR project, the other sites were examined within the framework of the Israel Antiquities Authority petrographic research program. The results of the research show a typo-chronological and provenance development of the sugar moulds and the molasses jars, that may be used for further dating the pottery assemblages. Under Fatimid and Crusader rule the pottery workshops, manufacturing the vessels for sugar production, were located in the coastal area. During the Mamluk and Ottoman period they moved further inland. The changes in both forms and fabrics, with corresponding changes in clay sources, are consistent with the transfer of the seat of government from 'Akko to Safed and are clear archaeological indications of the active involvement of the central government in the production of sugar.

6 ANTHROPOGENIC PEDO-SEDIMENTARY PROCESSES IN MIDDLE AGES: FROM MICROMORPHOLOGICAL ANALYSIS TO SOCIETAL IMPLICATION

Author(s): Borderie, Quentin (CNRS - UMR 7041 ArScAn; Service de l'archéologie préventive, département d'Eure-et-Loir) - Augry, Stéphane (Institut national de recherches archéologiques préventives) - Wech, Pierre (Mission archéologique de l'Eure; CNRS - UMR 7041 ArScAn)

Presentation Format: Oral

To answer to the question of the post classical town and to better understand the process of formation of Dark Earth, geoarchaeological investigations have been undertaken in urban environment of north of France since the beginning of the 1990s. Thus, many towns have been investigated throughout micromorphological analysis. More recently, other types of archaeological soil archives have been explored, including pit houses, indoor spaces, fortified places, elite settlements. The preservation of floors of indoor and outdoor spaces and the low bio-activity in such contexts allow to observe the micro-component in their deposit position. Thus, it can be possible to propose consolidated hypothesis of use of spaces. Moreover, it can be possible to observe other post depositional process leading to Dark Earth formation.

Since 2000s, the 5mm systematic counting on thin section and the single context method allow to get quantified data. This conducted to new methodological results such as the relation between macro records, archaeological artefacts, and chemical data. Moreover, even if problems of chronological correspondences still exist this quantification allows to compare more easily the results coming from different type of contexts, especially between Dark Earth environments and micro-stratified ones. At the settlement scale, it allows to get information on the use of space and activities, on which type of refuse in which type of spaces can be discarded. When comparing with archaeological features it allows to make correspondences and to precise hypothesis or give new ones. Moreover, the gathering of thousands of micro-component and pedo-sedimentary environment implies to propose new points of view to the middle ages practices and societies, especially when considering the waste management, the floor building process and material and the agricultural activities in urban environment.

7 SAME SAME BUT DIFFERENT? THE LIMITS AND POSSIBILITIES OF ANALOGIES IN (GEO)ARCHAEOLOGY

Author(s): Lo Russo, Sarah (University of Basel) - Flück, Hannes (Archäologischer Dienst Graubünden)

Presentation Format: Oral

In archaeological research analogies are often used to aid interpretation, for example in the reconstruction of social models, the interpretation of findings and structures or in geoarchaeological investigations.

In this paper, a case study from Roman Switzerland will be used to demonstrate that, whenever possible, these analogies should be used as part of a multidisciplinary approach.

The legionary fortress of Vindonissa has been under archaeological investigation for more than a hundred years. However, its civil settlement and its workshop for various handicrafts have rarely been the focus of interest. This has changed in recent years with the archaeological analysis of eight plots with nearly 40 successively built buildings at the western border of the settlement.

Among the features was a smithy with an angular but shallow pit whose filling was finely layered. Comparable structures are known from various roman small towns (vici) in Switzerland, and are generally considered to be slake troughs (pits filled with water, which were used to cool and harden freshly worked iron pieces). These interpretations are usually made by referring to other similar archaeological features.

Here we discuss the results from our multi-disciplinary investigation, which included reference to archaeological analogies, the application of micromorphology and SEM analyses, alongside a comparison with modern analogies. Our results clearly show that the roman pit at Vindonissa was not used as a slake trough but the microlayers were formed from trampled in material.

As a result of this work, we discuss whether it is legitimate to question the interpretation of slake trough at roman smithies. More generally, we ask how we can use data that we have generated at the micro level for the wider interpretation of archaeological features.

8 NEW QUESTIONS IN THE INVESTIGATION OF EARLY PASTORALISM IN THE IBERIAN PENINSULA: A MULTISCALAR PERSPECTIVE

Author(s): Polo-Diaz, Ana (IPHES-Institut Català de Paleoecologia Humana i Evolució Social)

Presentation Format: Oral

The expansion of the production economy in the Iberian Peninsula is currently one of the main research topics in the archaeological investigation of SW Europe. However, essential aspects concerning the subsistence of the Neolithic groups in the region, as the relative importance of livestock management in the farming way of life remain poorly understood.

Multiscalar interdisciplinary investigations that integrate geoarchaeological study of sediments from early pastoral sites located in caves and rock-shelters can improve our comprehension of how the new human-animal relationships introduced from the Neolithic in Iberia impacted the environment, the exploitation of natural resources and the territorial organization of early farming communities.

In this communication the methodological approaches used for the study of these archaeological contexts are synthesized to determine the key research questions that require further investigation and how the integration of archaeological, experimental

and ethnoarchaeological field and high-resolution multiproxies and their correlation at local and regional scale can help us to address those issues.

9 MORE THAN BULLSHIT! INTERDISCIPLINARY INVESTIGATION OF DUNG LAYERS FROM TWO PREHISTORIC SITES AND ITS SIGNIFICANCE AT THE MICRO- AND MACRO-SCALE

Author(s): Brönnimann, David (Integrative Prehistory and Archeological Science - IPAS, University of Basel; Archäologische Bodenforschung des Kantons Basel-Stadt) - Akeret, Örne (Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Knipper, Corina (Curt Engelhorn Centre Archaeometry GmbH) - Rissanen, Hannele (Archäologische Bodenforschung des Kantons Basel-Stadt; Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Stopp, Barbara (Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Thew, Nigel (Independent researcher) - Wegmüller, Fabio (Kantonsarchäologie St. Gallen; Integrative Prehistory and Archeological Science - IPAS, University of Basel)

Presentation Format: Oral

With the help of micromorphological analysis, dung cannot only be recognized in archaeological layers, but can also often be linked to the species that produced it. The identification of dung at the micro-scale is an exciting achievement, but it's only a first small step towards understanding an archaeological layer and perhaps the site itself. In this paper, we present two case studies where the interpretation of preserved dung has been taken to the next level using a multi-disciplinary approach.

The first site is a rock shelter located in the Alpine Rhine Valley of north-eastern Switzerland. It was used rather frequently from the Mesolithic to the Bronze Age, but in a variety of different ways. Micromorphological analysis has shown that the Neolithic and Bronze Age layers consist largely of burnt dung.

The second site is the Late Iron Age open air settlement Basel-Gasfabrik in north-western Switzerland. It was an unfortified central site with important trading connections to both the immediate and wider surrounding areas. Extensive geoarchaeological investigations have shown that more or less well preserved herbivore dung occurs in different archaeological structures.

To interpret the geoarchaeologically proven presence of herbivore dung at these two sites, a number of methodological approaches were chosen, including isotopic, archaeobotanical, archaeozoological and malacological investigations, as well as ethnological comparisons.

10 IDENTIFYING THE USE OF DUNG AS CONSTRUCTION MATERIAL DURING THE PRE-POTTERY NEOLITHIC (PPN) PERIOD

Author(s): Gur-Arieh, Shira (Department of Humanities, CaSEs Research Group, Universitat Pompeu Fabra) - Elliott, Sarah (Department of Archaeology, Anthropology and Forensic Sciences, Bournemouth University) - Finlayson, Bill (Department of Social Sciences, Oxford Brookes University) - Lancelotti, Carla (Department of Humanities, CaSEs Research Group, Universitat Pompeu Fabra) - Makarewicz, Cheryl (Institute for Prehistoric and Protohistoric Archaeology, University of Kiel) - Mentzer, Susan - Miller, Christopher (Senckenberg Centre for Human Evolution and Paleoenvironment, University of Tübingen; Institute for Archaeological Sciences, University of Tübingen) - Mizrahi, Sivan - Vardi, Jacob (Israel Antiquities, Jerusalem) - Madella, Marco (Department of Humanities, CaSEs Research Group, Universitat Pompeu Fabra)

Presentation Format: Oral

Since the early management of animals during the Pre-Pottery Neolithic B of Southwest Asia, animal dung has been used as a valuable resource. Recently, a growing body of archaeological sites from various areas and periods has presented evidence for the use of dung, especially for fuel, and manure. The ethnographic record highlights the common use of dung also as an important construction material. However, the use of dung for this purpose is so far less evident in the archaeological record due to either research bias, poor preservation of dung markers, or relative rarity of its use. In order to identify the exact cause for the lower representation of dung use for construction in archaeological sites and its cultural implications, we need: 1) To further develop the multi-proxy methodology for dung identification at the micro-scale of constructed features (using micromorphology, phytolith and dung spherulites analysis, and chemical analysis such as FTIR, ICP-AES and GC-MS spectrometry), 2) To map the spatial distribution of the different dung micro remains in the site in order to identify "hot spots" of dung use; and 3) To correlate the micro scale evidence for the use of dung to the macro-scale archaeological finds in order to have a better interpretation of the origin of the dung remains. The study of dung exploitation in general, and particularly its use in construction will contribute to our understanding of human-animal relations, subsistence practices, human technology, and human impact on the environment. It provides information on resource management according to human needs and environmental conditions (e.g. prioritizing construction over fuel or vice versa), which adds an innovative view-point on human adaptation strategies. Here we present preliminary results of the study of dung remains from Pre-Pottery Neolithic sites in the Southern Levant that form part of the MapDung Project.

11 PROCESSES OF BECOMING NEOLITHIC: A MULTI-SCALAR APPROACH USING GIS AND MICROMORPHOLOGY TO UNDERSTAND EARLY BUILT ENVIRONMENTS

Author(s): Guagenti, Alessandro (University of Reading)

Presentation Format: Oral

Research on the transition to more sedentary forms of living in south-west Asia has increasingly identified the complexities and multiplicities of human experiences in 'becoming Neolithic'. These experiences were contingent on numerous factors, at

multiple spatial and temporal scales.

Although the suite of benchmarks which we have used to measure this transition are themselves rather fluid, the move to increasing ways of sedentary living has been a defining feature of studying the Neolithic. The built environment, therefore, provides us with key foundations on which to study this critical time in human history.

However, the view at which archaeologists have examined this has often been rather two dimensional. There is a need to look at this subject from a more three dimensional perspective. This research will create a more holistic perspective in which to examine human interaction and movement, and how these endow and acquire meaning to spaces. These spaces, environments and landscapes are mutable, and influence human decision making. Furthermore, such environments are continually undergoing processes of being made and re-made by people.

It has become evident that more integrated, multi-scalar and interdisciplinary approaches are required to unpack the wealth of information related to different datasets of the archaeological record. Furthermore, an approach such as this will allow scholars to compare and integrate past projects with more recent data.

This contribution presents preliminary results of PhD research undertaken in the Central Zagros Region, as part of the ERC MENTICA project. This work aims in particular to address the issues outlined above by incorporating micromorphology with multiple approaches in spatial analysis at the meso- and macro-scale, alongside examination of vernacular architecture and sustainable communities. In doing this, a wide range of data can be incorporated, organised and critically analysed in GIS, to piece together the complex lifeways of Neolithic communities.

12 FROM THE ARCHIVE TO THE MICROSCOPE: AN INTERDISCIPLINARY APPROACH TO UNDERSTANDING DOMESTIC SPACE IN ANCIENT GREECE

Author(s): Schumacher, Mara - Shillito, Lisa-Marie - Skinner, Joseph (Newcastle University) - Nevett, Lisa (University of Michigan)

Presentation Format: Oral

This interdisciplinary project investigates how domestic space was organized in ancient Greece, focusing on the case study of Olynthos. The ancient city of Olynthos in Northern Greece was occupied during the 5th and 4th century BC until its complete destruction in 348 BC by Philip II. First excavations in the 1930s revealed over 50 houses preserved in excellent condition. Current research undertaken by the Olynthos Project aims to study the organization of space and their implications for social relations within the domestic sphere in more detail.

As part of the wider excavations, this project applies an innovative approach that combines theories, methods and data from different disciplines, incorporating data from archaeological excavations with micro-scale geoarchaeological analyses. The focus lies on the micromorphological analysis of floors and occupation deposits to reconstruct human activity and site formation processes. The interpretation of thin sections is supplemented with geochemical analyses (ICP-MS, SEM-EDX, GC-MS) which allows us to link chemical elements and compounds to specific human activities.

Geoarchaeological data will be integrated with observations from other scales including artefact distribution patterns and textual sources, to overcome limitations of the individual approaches, and enabling us to develop a more holistic understanding of domestic life in ancient Greece. By integrating multi-scale data from diverse disciplines we face the challenge of presenting our data in a simple and intelligible way that enables us to communicate geoarchaeological and in particular micromorphological data to non-specialists, particularly in this period where such an approach is not often applied.

13 INTRA-ROOM SPATIAL ANALYSIS: AN INTEGRATED MICROARCHAEOLOGICAL APPROACH FOR THE STUDY OF THE BUILT SPACE

Author(s): Cereda, Susanna (University of Vienna; ANAMED - Koç University)

Presentation Format: Oral

Micromorphology offers stimulating opportunities for the study of the built space in archaeology, as it helps to disentangle traces of past activities, decipher formation processes, reconstruct technologies and identify choices in the use of material resources. However, while providing localised and/or diachronic high-resolution observations, the small size of thin sections and the sampling strategies (mainly targeting exposed sections) do not allow to fully explore the spatial dimension of the built environment. In this paper, I will discuss the potential and limits of an approach, based on an intra-room spatial analysis, adopted for my PhD research in the site of Arslantepe (Malatya, Turkey). Here, an impressive sequence of superimposed occupation levels has been exposed over the course of more than 50 years of excavations, providing the opportunity for a systematic and detailed investigation of its earthen buildings. This research targeted four rooms that presented the best-preserved floors. The aim was to investigate the related nature of features and activities that constitute the lived space, in order to gain insights into the social relations that are recursively linked with those spatial structures. For this purpose, multiple micromorphological blocks were collected from different parts of these floors, to evenly cover each area and detect possible variations throughout the space. In addition, small quantities of loose sediment for spot-test analyses (proteins, pH, carbohydrates, carbonates, phosphates and fatty acids) were taken at equal intervals of 50cm and integrated with the micromorphological observations. Ultimately, the spatial interpolation of the results provided arguments to move beyond punctual observations and to transpose the interpretation from a micro- to a meso-scale, allowing to better understand the relationship between the built environment and the people that

physically interacted with it.

85 TRACKING NEOLITHISATION PROCESSES ON BOTH SIDES OF THE SINAI: A BRIDGE BETWEEN THE NEAR EAST AND NORTHEASTERN AFRICA

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Kapustka, Katarína (Institute of Archaeology, Czech Academy of Sciences, Prague) - Vieugue, Julien (CNRS, UMR 7055 Prehistory et Technology, Institute of Archaeology and Ethnology) - Bocquentin, Fanny (CNRS, UMR 7041 Prehistoric Ethnology, Institute of Archaeology and Ethnology) - Huysecom, Eric (Archaeology and Populations in Africa, University of Geneva)

Format: Regular session

The studies of Neolithisation in the Southern Levant and North-East Africa are two separate worlds of research. Indeed, the processes observed on both sides of the Sinai, seem to be quite different. However, recent data suggests some common aspects, such as the presence of Near-Eastern fauna taxa in East Africa.

The session aims to bring together researchers who are currently working on the Neolithic transition of both regions (Lybia, Sudan, Egypt, vs Palestine, Israel and Jordan), based on various types of materials such as settlement patterns, architecture, graves, pottery, lithic, fauna, botanical remains etc.

We would like researchers to propose synthesis regarding the type and pace of changes, as well as mechanisms of transformation from hunter-gatherers to farmers in a wide chronological frame for their own field of interest. Rather than tracking any theory of diffusion, long-distance contacts or cultural exchanges, the intention of this session is to better identify the major steps of the processes involved from different approaches.

In order to compare the data from both regions, we invite participants to make presentations that follow a common structure, including:

- Synthesis of available data/Critical review
- Tracking continuities and discontinuities
- Contextualising the emergence and development of those major changes
- Current scientific issues/ Perspectives of research

This session will allow those researchers, who have rarely had the opportunity to meet, to discuss and share their points of view and build a basis for future collaborations.

ABSTRACTS

1 WHAT PLACE FOR THE DEAD IN THE LEVANTINE NEOLITHIC PROCESS?

Author(s): Bocquentin, Fanny (UMR 7041 du CNRS. ArScAn, Equipe Ethnologie Préhistorique)

Presentation Format: Oral

With the establishment of a sedentary lifestyle in the Natufian and the subsequent development of an agro-pastoral economy in the Neolithic, the quantity of human burials in the Levant appears to have increased. Are they only there to mark the settlement of communities on a specific territory? Observations of contextual, funeral and biological data suggests that the dead are not as passive as they appear. The treatment of the corpse is revealing of the new place that the deceased occupied in the society. The removal of the skulls and their subsequent treatment (grouping, pigmentation, plastering) are not the only witnesses to the profound changes that took place. From the Natufian onwards, there was a redistribution of social roles where the (selected) deceased take an increasingly important place. The complexity of the funeral gestures adopted, testifies to the importance and diversity of the roles the living community assigned to them. Moreover, a close link of interdependence can be seen between burials, houses and other structures. Thus, the deceased seem to serve as identity reference points during the repositioning of human societies in their environment and belief system. This paper will present examples to illustrate this point and highlight major steps in this process.

2 THE ROLE OF STORAGE IN THE NEOLITHISATION PROCESS: PERSPECTIVES FROM SAI ISLAND AND BEYOND

Author(s): Hildebrand, Elisabeth (Anthropology Department, Stony Brook University) - SCHILLING, Timothy (United States National Park Service)

Presentation Format: Oral

Since Jacques Cauvin first proposed the Neolithisation concept, scholars have lauded this framework for broadening the scope of agricultural origins research. Rather than simply seeking to correlate climate changes and human responses, archaeologists now undertake more holistic assessments of changing social values and beliefs, and probe interactions between social spheres, economic choices, and the local environments in which change unfolded. Storage is a key variable in understanding how the process of 'Neolithisation' may or may not have progressed in a particular area, because it relates to both a) economic/subsistence needs that in turn are shaped by environmental conditions, and b) social values (such as sharing or ownership) and social desires

(such as predictable access to ingredients for larger gatherings or ceremonies). Using ethnoarchaeological examples, this paper first explores the ways in which cultural and environmental variables may both influence human choices of storage methods, as people weigh practical needs vs. social consequences. Second, the paper examines diachronic and geographic variation in methods of storage seen in the archaeological record - using a notable example from Sai Island and other examples situated in Egypt and Sudan from Final Pleistocene to Middle Holocene times - and considers the ways human choices in these contexts may have articulated with environmental, economic, and social changes. Finally, the paper uses archaeological examples from other regions (eastern Africa, Mississippi Valley in North America) to probe factors that may limit the Neolithisation process.

3 ON THE EVE OF NEOLITHISATION: SOCIAL, ECONOMIC AND SPIRITUAL STRATEGIES OF LATE HUNTER-GATHERERS BURIED AT THE SIXTH NILE CATARACT

Author(s): Varadinová, Lenka (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Varadin, Ladislav (Institute of Archaeology of the Czech Academy of Sciences, Prague; Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Havelková, Petra (Department of Anthropology, Natural History Museum, National Museum in Prague; Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Crevecoeur, Isabelle (UMR 5199 PACEA, CNRS, Université de Bordeaux) - Ambrose, Stanley (Department of Anthropology, University of Illinois Urbana) - Fort, Matthew (Illinois State Geological Survey, University of Illinois Urbana-Champaign)

Presentation Format: Oral

This paper presents results of multidisciplinary analyses of one of the largest Early Holocene burial grounds in Northeast Africa. The habitation site of Sphinx at Jebel Sabaloka in central Sudan was occupied by hunter-gatherers of the Early Khartoum culture between ~11,000 and 7,000 cal BP. The associated burial ground was used for 800 years between ~8,700 and 7,900 cal BP. Its large size (~300 m²) is ~30% of the entire 940m² of the combined area of the settlement and cemetery. Of an estimated 400–450 burials, 52 individuals have been uncovered, and 48 have been subjected to archaeological and natural scientific analyses.

The key findings on the buried population from the point of view of biology, demography, habitual activities, burial rite, spiritual habits, subsistence and mobility will be presented. This evidence will be integrated in the broader settlement and historical context, and with the framework of other Holocene hunter-gatherer burial grounds in Northeast Africa.

Jebel Sabaloka provides evidence for 4000 years of developments in Early Khartoum forager economy, ecology and society that set the stage for the transition to food production in the Sahel and Sahara. Models that prioritize the processes of diffusion of economic innovations and peoples in the spread of food production need to be revised to integrate the long trajectory of developments within this region. Our aim is to begin to define the social, economic and spiritual strategies of one uniquely documented population that shall serve as the basis for discussion of the circumstances of and reasons for Neolithisation of central Sudan.

4 LOCAL DEVELOPMENT AND LEVANTINE INFLUENCE SEEN IN THE LITHIC TECHNOLOGY OF THE FAYUM NEOLITHIC IN EGYPT

Author(s): Shirai, Noriyuki (Institute of Egyptology, Waseda University)

Presentation Format: Oral

Scholars on both sides of the Sinai Peninsula have considered the Fayum Neolithic in Egypt as a counterpart in the cultural interaction between the southern Levant and northeastern Africa at the time of Neolithisation in the Early–Middle Holocene. However, as their understanding of the Fayum Neolithic was not deep enough, their comparison of the material culture of both regions has tended to be superficial, failing to bridge a chronological gap between these regions. This paper will present a more detailed picture of various stone tools of the Fayum Neolithic that was gained through a recent restudy of the old lithic collections made in the early 20th century and currently housed in museums. It will also discuss the local development and Levantine influence seen in the lithic technology in the Fayum, and reconsider when and how Southwest Asian domesticates and the technical know-how of dealing with them were brought to the Fayum.

5 LANDMARKS IN EARLY ANIMAL DOMESTICATION: AN INTER-SPECIFIC AND INTER-REGIONAL STUDY OF THE LEVANTINE RECORD

Author(s): Gourichon, Lionel (Université Côte d'Azur, CNRS, CEPAM) - Horwitz, Liora Kolska (The Hebrew University of Jerusalem)

Presentation Format: Oral

Based on the archaeozoological (and archaeogenetic) record for the Northern and Southern Levant, this presentation will track the evolution of animal domestication in the region, from its initiation at the onset of the Pre-Pottery Neolithic period, ca. 10,500 years ago through to the establishment of fully fledged animal husbandry by the late Pottery Neolithic (ca. 6,500 BP). An integrated and up-to-date synthesis of current data for both regions for the four main domesticates – pig, sheep, goat and cattle, will be given. We will highlight inter-specific and inter-regional differences/similarities in the domestication process, which is of special interest given the tradition divide in timing and the cultural-historical sequences between the north and south. Issues to be discussed include - methodologies used to assess domestic status, single versus multiple origins of domestic taxa, autochthonous domestication, diffusion events and the chronology and rate of the process. Reference will also be made to the concurrent palaeoenvironmental, social and technological changes that have been documented in the archaeological record. Finally, we will examine possible shortcomings and strengths in the data sets and critically examine current approaches and interpretations, as

an aid to future research in the region.

6 NUBIAN LITHIC INDUSTRIES BETWEEN THE 9TH AND THE 6TH MILLENNIUM BC IN THE CONTEXT OF THE NEOLITHISATION OF NORTH-EASTERN AFRICA

Author(s): Jakob, Bastien (University of Neuchâtel, Institute of Archaeology)

Presentation Format: Oral

The Early Holocene Nubian lithic industries are generally characterized by the debitage of small flint, chert, agate or quartz pebbles found in the alluvial terraces of the Nile or in wadi deposits. The products are essentially flakes, but bladelets are appreciated for the manufacture of numerous geometric microliths (lunates, triangles, trapezes) and backed pieces used to arm arrows. Scrapers, perforators and notched pieces complete the common toolset.

The first proper lithic studies undertaken in Nubia were conducted by the Combined Prehistoric Expedition directed by F. Wendorf during the UNESCO salvage campaigns in the 1960s. These studies constitute the basis for defining the Nubian cultural sequence stretching from the Late Pleistocene to the Middle Holocene. Since then, the work of D. Usai has permitted readjustments and a better understanding of the evolution of the lithic industries between Early to Middle Holocene. However lithic studies are scarce in Nubia, especially in Upper Nubia. The discovery in the 2000s by M. Honegger of two Early Neolithic sites dated to the first half of the 6th millennium BC in the Kerma region offer new data to apprehend the neolithisation of Nubia. The analysis of the lithic industries - in progress in my PhD thesis - does not show a real rupture, but some new typological and technical components originating from the North seem to appear in conjunction with the first livestock.

7 HIERARCHICAL SETTLEMENT SYSTEMS AND POTTERY VARIABILITY OF LATE FORAGERS AND EARLY HERDERS AT JEBEL SABALOKA, SUDAN

Author(s): Garcea, Elena (Department of Letters and Philosophy, University of Cassino and Southern Latium) - Varadinová, Lenka (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Varadin, Ladislav (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Ambrose, Stanley (Department of Anthropology, College of Liberal Arts and Sciences, University of Illinois at Urbana – Champaign, Urbana)

Presentation Format: Oral

This paper presents the results of new surveys with test excavations and an analysis of variability of pottery productions. It provides evidence for spatial and temporal relations between task sites, minor settlements and the core sites of Sphinx and Fox Hill. It also offers new dating and interpretation of the settlement systems by late foragers and early herders. Finally, the large pottery assemblages from Jebel Sabaloka may contribute to building a solid bridge between the Near East and Northeastern Africa.

Repeated surveys in the western part of the Jebel Sabaloka and in the surroundings of the Sixth Nile Cataract, in central Sudan, have brought to light some thirty sites occupied by late foragers (Mesolithic, Early Khartoum) and early herders (Shaheinab Neolithic). The sites differ in size, depth of deposits, finds and primary activities. They could be classified according to a three-level hierarchy, consisting of task sites, minor settlements, and core occupation sites. Sphinx (SBK.W-60) is core site that preserves more than one meter of anthropic sediments. Its chronology anticipated the emergence of the Early Khartoum complex to the beginning of the ninth millennium BC. Abundant impressed and incised pottery is present from the lowest levels, confirming that systematic pottery production in Northeastern Africa dates from the late tenth/early ninth millennium BC, as observed in the Egyptian Western Desert.

The decorated pottery from Northeastern Africa offers hints on the origin of pottery in the Near East: impressed sherds are found in the Pre-Pottery Neolithic C in Turkey, dating to beginning of the seventh millennium BC. They are totally different from local Pottery Neolithic ceramics and were thought to have a western, Mediterranean, origin. However, impressed pottery is about two-thousand years older in Northeast Africa. Therefore, impressed pottery in the Near East might originate from Northeastern Africa.

8 THE EVOLUTION OF FUNERARY PRACTICES AND POPULATION FROM EPIPALAEOLITHIC TO NEOLITHIC: THE EMBLEMATIC CASE OF EL-BARGA (SUDAN)

Author(s): Honegger, Matthieu (University of Neuchâtel) - Crevecoeur, Isabelle (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Oral

The site of El-Barga is located in Northern Sudan, 20 km to the south of the third cataract of the Nile, on the edge of the alluvial plain. Between 2001 and 2014 excavations were undertaken firstly on the remains of an Epipalaeolithic habitation structure dated from 7500 to 7300 cal BC. Then the fieldwork focuses on two cemeteries, one of Epipalaeolithic period (7800-6700 cal BC) which revealed 45 inhumations and the other of Early Neolithic period (6000-5500 cal BC) with 108 individuals.

The contrast between the Epipalaeolithic and Neolithic burials is striking and evokes those brought to light in the site of Gobero in central Sahara. The individuals from the earlier burials have a robust morphology and are seldom buried with personal adornments. By contrast, the later ones are more gracile and are accompanied by offerings and personal effects, mostly made up of tools and adornments. In addition, the comparative anthropological comparison of both assemblages underlines phenotypic differences consistent with biological discontinuity in the human occupation of the area. Finally, the pottery presents either surfaces covered in impressed decorations of Sudanese Style or a burnished surface, whose diffusion from the north to the south

is more or less synchronous with the flow of Neolithic diffusion. This Early Neolithic cemetery, which is the oldest known for the African Neolithic, announces at an early date the rites that were practiced in the Nubian cemeteries from the 5th millennium BC onwards.

- 9** **LIFE ON THE RIVER BANK. VIEW FROM THE MESOLITHIC AND NEOLITHIC KHOR SHAMBAT**
Author(s): Jórdeczka, Maciej - Bobrowski, Przemysław (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Chłodnicki, Marek (Archaeological Museum Poznań) - Osypińska, Marta - Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Stanaszek, Łukasz (Anthropological Laboratory, State Archaeological Museum) - Kubiak-Martens, Lucy (Biax Consult)
Presentation Format: Oral
- Located in Omdurman, approximately 8 km north of where the Blue and White Nile meet and 100 m from the current riverbed, Khor Shambat is an exceptional place to study the Early and Middle Holocene in Central Sudan. The interdisciplinary research, conducted as a part of the National Science Centre, Poland project (Grant no. 2015/17/D/HS3/01492 - A new perspective on pre-historic societies of the Early and Middle Holocene in Central Sudan in the view of interdisciplinary research studies), uncovered the presence of stratificated remains of Mesolithic and Neolithic settlement, accompanied by ample archaeological material, as well as radiocarbon dated burials from several chronological horizons. Use of the latest analytical methods to evaluate the material collected over the last 3 years will allow us to significantly supplement current knowledge regarding the environmental and cultural changes which took place here between 7000 and 3000 calBC, including the mechanisms of transformation from a hunter-gatherers to farmers.
- 10** **THE BEGINNING OF THE POTTERY PRODUCTIONS IN THE SOUTHERN LEVANT (7TH MILLENNIUM CAL. BC): A CRITICAL REVIEW**
Author(s): Vieugué, Julien (CNRS) - Eirikh-Rose, Anna (IAA)
Presentation Format: Oral
- Located between South-west Asia (Syria) and North-east Africa (Egypt) that are two major centers of invention of pottery, the Southern Levant is a key study region to raise various historical issues related to the widespread adoption of pottery. Yet, this area of the Fertile Crescent has so far remained on the sidelines of research on the early ceramic productions because of the late appearance of pottery (second half of the 7th millennium cal. BC). Although several theories have been put forward on the paces, causes and processes for the widespread adoption of pottery in the southern Levant, the different assumptions remain highly speculative because of the lack of consistent data on the first pottery productions.
- This paper presents a critical review of current knowledge on the emergence of pottery in the southern Levant. We will first discuss chronological issues based on the thorough analysis of stratigraphic data, ceramic styles, and available C14 dates. Then, we will discuss the reasons for the appearance of pottery in the southern Levant through a renewed approach of the utilitarian and social functions of the earliest pottery in the region. Finally, we will discuss the processes for the widespread adoption of pottery based on the available data regarding the manufacture of the first ceramic vessels.
- 11** **NEOLITHIC IN THE WESTERN DESERT IN LIGHT OF RESEARCH CONDUCTED IN THE AREA OF BERGET EL SHEB AND NABTA PLAYA**
Author(s): Bobrowski, Przemysław - Jórdeczka, Maciej (Institute of Archaeology and Ethnology PAS)
Presentation Format: Oral
- For nearly 50 years, the Combined Prehistoric Expedition (CPE) and the associated missions led by the Institute of Archeology and Ethnology of the Polish Academy of Sciences have been conducting excavations in the Western Desert of Egypt. Among the most important achievements of the CPE of the Western Desert is the confirmation of intensive Neolithic settlement in the Gebel Nabta, Bir Kiseiba and Berget el Sheb, Gebel Ramlah regions, based on the breeding of cattle, sheep, and goats, growing and gathering wild millet, and the discovery of megalithic complexes. Moreover, the long-lasting-research allowed us to draw a general scheme of the cultural development in the Western Desert. It is related to climatic fluctuations and settlement changes observable in the sequence of wet and dry periods. Each wet period had its specificity in the scope of precipitations, fauna, flora, etc. Changing conditions required cultural adaptations which had been reflected in ways of life and social organizations. Can we, in light of the latest research, speak of a full Neolithic packet in each of the outlined principal phases in the region? In our presentation, we wish to show the complexity of issues of Neolithic genesis and development in Western Desert, from the Early Holocene settlement in the Desert, through the Holocene Optimum, until the end of prehistoric settlement in the area at the end of 4.5 ca cal. BP.
- 12** **VISIBILITY OF NEOLITHISATION WITHIN LITHIC COLLECTIONS FROM CENTRAL SUDAN**
Author(s): Kapustka, Katarína (Institute of Archaeology of the Czech Academy of Sciences)
Presentation Format: Oral
- Within central sudanese prehistory is strong traditionality within lithic toolkit. There are almost no ruptures and majority of types of last hunter-gatherers are similar if no the same as are those of first agropastoralists. Most typical tool are segments/crescents/lunates for both periods/ lifestyles. There are slight changes within representation of different types of microliths. But

this evidence did not show any major shift of subsistence strategies.

Fortunately for the early Neolithic period there is one exception and this is presence of gouges (axe like bifacially shaped artefacts). Within lithic collection they are seen as a marker of Neolithic period. They last for quite short period (about 500 years 5500–5000 cal. BC). Especially for surface collections or sites with badly visible stratigraphy (which are quite abundant in this region) within lithics gouges are almost only way how we are able to distinguish neolithic collections from slightly older hunter-gatherer assemblages. Until today no detailed use wear analysis was done on them so we are not sure how they fit to the puzzle of Neolithisation. According to our preliminary use wear observations they served for woodworking.

13 RESULTS OF PALEOBOTANICAL ANALYSES CARRIED OUT AT THE KADRUKA SITE IN UPPER NUBIA

Author(s): Emery-Barbier, Aline (CNRS-UMR 7041 Prehistoric Ethnology, Institute of Archaeology and Ethnology) - Saad, Marie-Claude (CNRS-UMR 7041 GAMA Institute of Archaeology and Ethnology)

Presentation Format: Oral

The Kadruka site, on the right bank of the Nile south of the 3rd cataract, is crossed by the Wadi el-Khowi, a former branch or course of the Nile that flowed about ten kilometers east of the current course. It was a major settlement pole for the populations between fifth and fourth millennium BC.

Under thick layers of silt, a great number of funerary sites and settlements have been identified. While wind erosion has considerably abraded settlements, cemeteries located on small hills have proven more resilient and are preferred study structures to understand societies.

The rich archaeological material extracted from the graves of the KDK1 funeral mound excavated by J. Reinold in the 1980s and 1990s is currently under study. The preservation of the material, despite decades of storage, lends itself to anthracological studies, as well as to palynological, phytolithic and non-pollen palynomorphs (NPPs) analyses. They concern objects, deposits in vases or around the deceased, textiles, pillow contents. The same study was carried out on the burials of the KDK 23 funeral mound, with the exception of anthracology.

The analysis of dental calculus collected from individuals buried in cemeteries 1, 18 and 23 is ongoing.

The presence of non-native taxa and cereals in the samples studied raises the problem of their origin, culture and process at the end of the 5th millennium BC, the results obtained in settlements levels dated to the end of the fifth millennium not being indicative of their presence.

14 PASTORALISTS WHO PRACTICE AGRICULTURE: NEW PERSPECTIVES FROM JEBEL MOYA (SUDAN)

Author(s): Vella Gregory, Isabelle (University of Cambridge) - Brass, Michael (University College London)

Presentation Format: Oral

The establishment of mixed agropastoral, or pastoral with a strong element of agriculture, economies and their initial dispersals across North-East Africa is still poorly known. This is especially true in the eastern Sahel (Sudan), despite this region long regarded as central to the origins of sorghum agriculture. Recently, studies of sorghum chaff imprints in ceramics has pushed back domestication processes to between 3500 - 300 BC at KG23 near the Atbara river (eastern Sudan). This early sorghum is associated with hunting and fishing only. Later evidence for probably mixed cultivation of sorghum and pearl millet by ca. 1850 BC from site K1 (Kassala) is associated with the herding of goats and sheep. This mixture of savanna pastoralism and sorghum remained the foundation of the economy through the rise of the later Meroitic state (ca. 350 BC - AD 350). This raises questions about how early pastoralism and sorghum cultivation were integrated and how quickly they spread within African savanna ecosystems.

The new archaeological fieldwork at Jebel Moya (ca. 240km south south-east of Khartoum) has produced robust empirical data confirming integrated sorghum cultivation with cattle, sheep and goat pastoralism by the mid-third millennium BC. Lipid residue analysis on sherds from 2000 years ago show animal fat and plant processing. A dating program has started on identified crop and domesticated faunal remains, in addition to prior luminescence dates direct on pottery, which have been revised. These dates also provide improved chronological sequences for the deposits excavated in the October 2017 fieldwork season, the first systematic excavations since Henry Wellcome (1911-14). The site, with ca. 4.7 hectares of unexcavated archaeological deposits remaining, provides extraordinary scope for examining how communities in the eastern Sahel with a strong pastoral component integrated agricultural activities and how these were constituted.

88 FUNERARY PRACTICES AT ÇATALHÖYÜK AND IN THE NEOLITHIC NEAR EAST: MULTIDISCIPLINARY PERSPECTIVES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Milella, Marco (Department of Anthropology, University of Zurich) - Knüsel, Christopher (De la Préhistoire à l'Actuel: Culture, Environnement, et Anthropologie (PACEA), Université de Bordeaux,) - Haddow, Scott (Department of Archaeology and Art History Koç University)

Format: Regular session

Neolithic Çatalhöyük (7100-5950 cal BC), located in south central Anatolia, is one of the largest and best-preserved Neolithic settlements in the Near East. The site is characterized by a pattern of densely agglomerated domestic structures; to date, evidence for public/non-domestic buildings and spaces is lacking. Çatalhöyük is well-known for its rich array of symbolic/ritual

traditions, which is expressed via wall paintings, animal installations, figurines and funerary practices. Human burials represent one of the most important types of sociocultural evidence at Çatalhöyük. The large number of burials, excellent preservation, and variable funerary practices, provide a unique opportunity to address a suite of research questions, including:

- a) How are funerary practices at Çatalhöyük indicative of social distinction in this community?
- b) How do funerary practices vary over time at Çatalhöyük, and do these changes correlate with observed demographic changes at the site?
- c) What selection criteria prompted the use of specific items (floral, faunal, and artefactual) in funerary practices?

And, especially:

- d) How do the above patterns fit within the broader context of the Near Eastern Neolithic?

By including contributions from a wide range of disciplines (biological and socio-cultural anthropology, archaeology, zooarchaeology, and palaeobotany), this session presents interdisciplinary perspectives on funerary practices at Çatalhöyük and more generally in the Neolithic Near East in order to stimulate discussion of the ways in which funerary remains, in general, contribute to understanding once living communities.

ABSTRACTS

1 A MULTI-PROXY ANALYSIS OF DIACHRONIC CHANGES IN THE SOCIAL DIMENSIONS OF SEX AND AGE-AT-DEATH AT NEOLITHIC ÇATALHÖYÜK

Author(s): Milella, Marco (Department of Anthropology & Anthropological Museum, University of Zürich-Irchel) - Haddow, Scott (Department of Archaeology and History of Art, Koç University) - Vasic, Milena (Independent Researcher) - Tibbetts, Belinda (Department of Archaeology, University of Exeter - Knüsel, Christopher (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Oral

Among the most important aspects of social identity are sex and age-at-death. How these two pillars of social identity change during the life course of individuals forms a focus of archaeological attempts to reconstruct the lived experience and social structure of past human communities. With few exceptions, however, archaeological exploration of life course changes are often encumbered by a lack of integration of skeletal evidence, limited analytical approaches, and lack of a diachronic perspective. The Neolithic of the Near East provides an ideal archaeological setting to test the links between growing population densities and cultural complexity and alterations in the social perceptions of sex and age-at-death. Here, we update and expand previous analyses of gender and the life course at Neolithic Çatalhöyük (Central Anatolia, 7100-5950 cal. B.C.) by means of an interdisciplinary approach based on palaeopathological, funerary archaeological, and material cultural evidence, a multivariate analytical strategy, and a comparative perspective. The latter permits a contextualization of the observed patterns at Çatalhöyük against the broader picture of the Neolithic Near East. The results provide a new angle from which to consider the structuring of lived experience in this Neolithic community through time, at the same time providing a perspective on the social variability characterizing the Neolithic Near East

2 FUNERARY TREATMENT OF ÇATALHÖYÜK SUBADULTS: IMPLICATIONS FOR THE STUDY OF SOCIAL VARIABILITY AND CULTURAL TRADITION IN NEOLITHIC NEAR EAST POPULATIONS

Author(s): Tibbetts, Belinda (University of Exeter)

Presentation Format: Oral

The funerary treatment of pre-childhood (younger than 12 months) subadults in the Neolithic Near East has received considerable attention for various characteristics including containment of the body, intramural location, burial inclusions and body preparation. However, patterns and changes in the funerary treatments of this group of individuals over longer temporal periods are seldom addressed. The duration of occupation at Neolithic Çatalhöyük and the in-depth study of its archaeological record provide a unique resource for evaluating the long-term funerary practices and treatments in use at a single site.

Evidence for social distinction within the Neolithic population of Çatalhöyük, expressed through the social identity and cultural value placed on individuals, is reflected in the funerary treatment of very young individuals. The differences between the funerary treatment of maternal-fetal mortalities and other adults also appear to reflect the social distinction and identity given by the living to the unborn individual, and extended to its mother.

Here, I present findings on patterns in the funerary treatment of pre-childhood subadults from Neolithic Çatalhöyük and their significance for interpreting broader trends in socio-cultural behaviours of the living population. Results of this study highlight the potential of a fine-grained analysis of pre-childhood funerary treatment for untangling the roles of age, cultural tradition vs. innovation, and diachronic social variability at Çatalhöyük and across the Neolithic Near East.

3 AN INTEGRATED APPROACH TO REVEALING HUMAN BIOGRAPHIES. THE CASE OF THE NEOLITHIC SETTLEMENT AT ÇATALHÖYÜK IN CENTRAL ANATOLIA

Author(s): Harabasz, Katarzyna (Adam Mickiewicz University)

Presentation Format: Oral

This paper outlines an innovative research model that focuses on the human being by bringing together a set of methods for

studying human osteobiography. The holistic and interdisciplinary integration of lifecourse approaches, together with contextual archaeological and osteological data, as well as network analysis approaches extends the interpretative possibilities of studies of human skeletal remains. The potential of this approach will be discussed by applying it to individuals excavated from the Neolithic site of Çatalhöyük in Central Anatolia. The paper goes beyond the formula of perceiving the elements of the funeral rite as a manifestation of the social position of the deceased in two aspects. Firstly, instead of focusing on social status, it attempts to reconstruct the entire life history of the deceased in multiple dimensions. Secondly, in the context of achieving these goals, it goes beyond a formal analysis of funerary rites to propose a comprehensive and integrated method for examination of archaeological manifestations of biographies.

4 **SOCIAL VIOLENCE AND INTOLERANCE AT NEOLITHIC ÇATALHÖYÜK, CENTRAL ANATOLIA, TURKEY (7100-5950 CAL. B.C.)**

Author(s): Knusel, Christopher (De la Préhistoire à l'Actuel: Culture, Environnement, et Anthropologie - PACEA, Université de Bordeaux, UMR 5199 PACEA) - Milella, Marco (Department of Anthropology & Anthropological Museum, University of Zürich-Irchel) - Belmonte, Cristina (Independent researcher, IPAT Serveis Culturals, Catalunya) - Bennison-Chapman, Lucy - Doyle, Sean (Independent Researcher) - Tsoraki, Christina (School of Archaeology and Ancient History, University of Leicester) - Glen-cross, Bonnie (Department of Archaeology and Heritage Studies, Wilfrid Laurier University)

Presentation Format: Oral

The large Neolithic tell site at Çatalhöyük holds an iconic status as an early mega-site settlement in the Konya Plain of central Anatolia. Its large size of some 13 ha and considerable population density, without apparent social distinctions among its inhabitants, has made it an anomaly when other, albeit later sites, provide evidence of social differentiation. Because of its early date, signs of social differentiation may be subtle and seem inconsequential when compared with those of later developments. This study uses evidence of cranial trauma and anomalous or irregular burials, those found outside of the more commonplace burial beneath house platforms, to suggest that individual social distinction was present at the site. Two adult males and an adolescent were found in anomalous burial locations, but females sustained a greater number of cranial injuries than males, and the patterning of injuries is different between the two sexes. It seems that both exclusion from platform burial and violence were engendered and represent a form of social distinction. The site thus seems to provide a glimpse of early manifestations of inegalitarian social relations that developed in a more fully blown manner in the Late Neolithic and Bronze Age.

5 **FUNERARY PRACTICES AT NEOLITHIC ÇATALHÖYÜK (CENTRAL ANATOLIA): WHAT USE-WEAR ANALYSIS AND CHIPPED STONE TOOLS MAY TELL US**

Author(s): Lemorini, Cristina (Sapienza University of Rome) - D'Errico, Davide (Leiden University, Sapienza University of Rome)

Presentation Format: Oral

This talk presents the results of use-wear analysis of chipped stone tools deliberately placed in burials found in the Neolithic levels of the mega-site of Çatalhöyük (Central Anatolia). Funerary practices played an important role in the Çatalhöyük Neolithic community. Chipped stone tools made both of obsidian and flint were sometime part of the grave goods and use-wear analysis reveals a piece of their history and their role in these so meaningful situations.

Use-wear analysis can tell us if chipped stone tools participated actively as a medium used for making some of these practices, or if they were deposited in a new or in used state in the burials after they had had a "long life" before their deposition in a grave. Each of these possibilities opens different scenarios and help us to define variabilities or constancy of these practices at Çatalhöyük in its Neolithic phases. Moreover, a comparison between the use-wear observed on chipped stone tools found in funerary and in "life" contexts will be presented with the aim to produce other suggestions for the understanding of the role of the chipped stone tools in Çatalhöyük society.

6 **MICROHISTORIES OF FUNERARY PRACTICES AT NEOLITHIC ÇATALHÖYÜK, TURKEY: INSIGHTS FROM THE STONE AND SHELL BURIAL ASSEMBLAGES**

Author(s): Tsoraki, Christina (University of Leicester, School of Archaeology and Ancient History) - Veropoulidou, Rena (The Wiener Laboratory, American School of Classical Studies at Athens)

Presentation Format: Oral

Excavations at the site of Neolithic Çatalhöyük (ca. 7100-6000 cal BC) over the past 25 years have revealed rich architectural remains, along with diverse artefactual and ecofactual assemblages. The burial landscape at Çatalhöyük is characterized by intramural interments of mainly flexed primary inhumations, that were often furnished with objects of personal adornment such as composite necklaces, bracelets and anklets made from beads of different forms and materials. Through a comparative analysis of stone and shell grave inclusions, in particular beads, the aim of this paper is to unravel the microhistories of funerary practices and to discuss practices of bodily adornment as evidenced through burial associations. Following a chaîne opératoire approach, the analysis of stone and shell grave inclusions highlights similarities and differences and suggests that materials of distinct origin and appearance (in terms of sources and physical properties), technological skill and temporalities were assembled during funerary acts at Çatalhöyük. Particular emphasis is placed on the use-wear traces of stone and shell beads that indicate that objects with varying biographical complexities (prolonged or short biographies) were often combined to form composite pieces of adornment to decorate the dead. Practices such as this may have entailed the concerted actions of different individuals or

multiple social groups engaged in the construction of the individual and group identity. The correlation of the biography of grave goods with the biography of the people they were buried with (in terms of age and gender) will enrich our understanding of funerary rites at Neolithic Çatalhöyük.

7 FUNERARY PRACTICES AT ÇATALHÖYÜK WITHIN THE BROADER FRAMEWORK OF THE NEOLITHIC IN CENTRAL ANATOLIA

Author(s): Pilloud, Marin (University of Nevada, Reno) - Haddow, Scott (Department of Archaeology and Art History, Koç University) - Knüsel, Christopher (De la Préhistoire à l'Actuel: Culture, Environnement, et Anthropologie - PACEA, Université de Bordeaux) - Larsen, Clark (Department of Anthropology, The Ohio State University)

Presentation Format: Oral

Within Çatalhöyük, individuals are interred within the homes predominantly as primary single inhumations; however, multiple burials are also present and may have occurred over several burial events. Remains also show potential evidence for varying levels of decomposition and defleshing. Further, there is head and limb removal as well as one decorated skull. These mortuary practices are not entirely unique to Çatalhöyük. They are instead part of a larger pattern that can be observed within central Anatolia, which is generally part of the Neolithic package that appears to accompany the adoption of plant and animal domestication.

In this presentation, the funerary practices of Çatalhöyük are compared and contrasted with those of surrounding sites both in time and space. These sites include: Körtik Tepe, Çayönü, Boncuklu, Aşıklı Höyük, Çatalhöyük, Tepecik-Çiftlik, and Köşk Höyük. Through this discussion, it is argued that mortuary practices in central Anatolia served as a means to reinforce social memory and maintain social stability in the face of vast cultural change. These ritualized behaviors aided in the Neolithization of the region and largely disappeared at the end of the Neolithic as populations became increasingly socially stratified.

8 A HISTOTAPHONOMIC APPROACH TO ASSESSING FUNERARY PRACTICES IN NEOLITHIC ANATOLIA

Author(s): Haddow, Scott - Votruba, Sila - Özbal, Rana (Koç University Department of Archaeology and History of Art) - Pearson, Jessica (Department of Archaeology, Classics and Egyptology, University of Liverpool)

Presentation Format: Oral

Recent bioarchaeological analyses at several Neolithic sites in Anatolia have revealed substantial inter- and intra-site variation in the level of skeletal completeness, preservation, articulation and flexion among primary burials. Furthermore, organic remains from burnt contexts at sites such as Çatalhöyük demonstrate that many bodies were tightly bound and wrapped using cordage, matting, textile and animal hides. These observations are suggestive of a period of delay between death and final burial for certain individuals, likely as part of a multi-stage funerary rite, perhaps seasonal in nature. It appears that some bodies may have been processed in such a way as to facilitate their temporary storage prior to burial. Potential treatments include exposure, excarnation or desiccation of the corpse prior to binding and wrapping. In order to test this hypothesis, thin sections from human cortical bone samples taken from three Anatolian Neolithic sites (Çatalhöyük, Boncuklu Höyük and Barcin Höyük) were analysed using light microscopy and SEM imaging techniques in order to assess variation in bone microstructure preservation. As endogenous gut bacteria released into the body at the onset of putrefaction is believed to be responsible for a particular pattern of microstructural alteration, the lack of such bioerosive features may indicate some form of postmortem treatment aimed at reducing soft tissue body mass.

9 FUNERARY PRACTICES IN THE PRE-POTTERY NEOLITHIC SITE OF KHARAYSIN (ZARQA, JORDAN)

Author(s): Santana, Jonathan (Durham University) - Ibáñez Estévez, Juan José (Consejo Superior de Investigaciones Científicas - CSIC) - Teira, Luis (Instituto Internacional de Prehistoria de Cantabria, Universidad de Cantabria) - Muñiz, Juan (Universidad Pontificia San Esteban de Salamanca)

Presentation Format: Oral

We explore the burial practices of the Pre-Pottery Neolithic site of Kharaysin (Zarqa, Jordan). The funerary evidence includes primary and secondary burials, and skull caches dated from the Late Pre-Pottery Neolithic A (LPPNA) to the Late Pre-Pottery Neolithic B (LPPNB). Most burials have been recorded in the PPNB levels where most research has been done so far. We have found primary burials with associated grave goods within a domestic building in the PPNA levels. Skull and bone retrieval are observed in these burials, although burial disturbance prevents to consider if all the burials were affected. In the Middle PPNB levels, we have found burials outside the domestic buildings and a funerary area with primary and secondary burials linked to complex rituals with associated paraphernalia. We also observed burials with faunal remains that aimed to establish a symbolic relationship between people and animals. Furthermore, a secondary burial with cremated bones was found in the LPPNB levels, which represents an early example of this funerary practice in the Near East. We take into consideration all the available evidence to produce a picture of the burial practices and their deviations across the time. Our preliminary results stress the importance of the mortuary behaviour to understand the evolution of the symbolism associated to the dead in the Neolithisation of the Near East.

A MULTIDISCIPLINARY APPROACH TO INVESTIGATE A UNIQUE CREMATION CUSTOM FROM THE 7TH MILLENNIUM AT BEISAMOUN, NORTHERN ISRAEL

Author(s): Bocquentin, Fanny (UMR 7041 du CNRS, ArScAn, Equipe Ethnologie Préhistorique - Anton, Marie (École Doctorale d'Archéologie, Université Paris 1, Panthéon-Sorbonne; Musée de l'Homme, Éco-Anthropologie et Ethnologie, CNRS, UMR 7206, Paris) - Berna, Francesco (Department of Archaeology, Simon Fraser University) - Greenberg, Harris (Department of Archaeology, Boston University) - Hart, Thomas (Department of Anthropology, University of Texas at Austin) - Horvitz, Liora Kolska (National Natural History Collections, The Hebrew University, Jerusalem) - Khalaily, Hamoudi (Israel Antiquities Authority) - Lernau, Omry (National Natural History Collections, The Hebrew University, Jerusalem) - Ramsey, Monica (McDonald Institute for Archaeological Research University of Cambridge) - Rosen, Arlene (Department of Anthropology, University of Texas at Austin)

Presentation Format: Oral

In the Levant, the renewed excavations at the well known PPNB site of Beisamoun (Upper Jordan Valley, Israel) has resulted in the discovery of a 7th millennium occupation layer (PPNC), contemporary with the founding of Çatalhöyük. Within the habitation, but in temporarily abandoned areas, several graves have been unearthed. They testify to a great diversity of funerary forms: primary burials, secondary deposits, skull removal, crania plastering, and cremations. The latter are the earliest yet found in the Near East. One cluster appears to be a cremation pit that also served as the final burial spot. This specific case, which involved a cremated young adult, who survived from a flint projectile injury to the left shoulder, will be the focus of this presentation. The right fibula has been directly dated to 7031-6700 cal BC. Archaeothanatology, zooarchaeology, micromorphological analysis, and phytolith identification are combined in order to explore the different stages and techniques involved in this rare event: cremation pit construction, selection of fuel, primary position of the corpse, potential associated items and funerary containers, fire management, post-cremation gesture and structure abandonment. The origins and development of cremation practices in the region are explored as well as their significance in terms of Northern-Southern Levantine connections during the 7th millennium.

'MASSIVE MIGRATIONS'? MULTISCALAR AND MULTIDISCIPLINARY APPROACHES TO PREHISTORIC MIGRATIONS AND MOBILITY IN EUROPE

Theme: Archaeological theory and methods beyond paradigms

Organisers: Diaz-Guardamino Uribe, Marta (Durham University) - Heyd, Volker (University of Helsinki)

Format: Regular session

The last few years have witnessed the publication of a series of papers proposing the occurrence of 'large-scale migrations' mostly in third millennium cal BC Europe. The uproar in the archaeological community was immediate, for these were interpretations based primarily on the statistical modelling of aDNA datasets. There were problems (e.g. important gaps) with the sampling, and, notably, the complexity of the archaeological record of the regions involved (some in clear disagreement with a large-scale migration model) was largely ignored. In addition, archaeologists have highlighted the need for developing appropriate theoretical frameworks for addressing past migrations and mobility at multiple scales, as well as a shared language for facilitating the communication among geneticists and archaeologists. Less mentioned but equally important is the need to go beyond the 'grand-narrative' as the sole possible framework for addressing past migrations. There is therefore an urgent need to develop multiscalar and multidisciplinary approaches which pay adequate attention to the micro- and meso-scales, and their potential to generate richer understandings of regional-scale social and economic processes —and their temporalities— underlying larger-scale population dynamics.

This session aims to bring together contributions presenting multiscalar, multidisciplinary and theoretically informed research on migrations and mobility of humans, animals, artefacts/materials, and/or knowledge in prehistoric Europe. We are particularly interested in papers developing innovative theoretical frameworks to past migrations and mobility, frameworks that address social and economic processes and their relationship with larger scale population dynamics, research that uses varied lines of evidence and a range of scientific methods for the study of past mobility at multiple interlinked scales (e.g. aDNA, isotope analyses, petrography, Bayesian modelling).

ABSTRACTS

1 WHY PREHISTORIANS LARGELY REJECTED INVASIONIST INTERPRETATIONS IN THE 1960S AND 1970S

Author(s): Collis, John, Ralph (University of Sheffield)

Presentation Format: Oral

With the paradigm shift of the 1960s and 1970s there was a move in prehistoric archaeology away from Culture History models based on languages to other approaches taken from a range of other disciplines. It also saw, if not a total rejection of the invasionist models usually associated with language change, at least a greater emphasis on other sorts of models for culture exchange such as Peer Polity Interaction (Renfrew and Cherry). Personally I was mainly dealing with invasionist models used, for instance, to identify the origin and expansion of the Celts (ethnicity, language, art, material culture) and also to understand the British Iron Age for which I developed an 'Overlapping Systems' model for the adoption of coin using. More recently approaches such as 'Networks' have come into favour. The recent work of geneticists have tended to ignore these different approaches and

they have reverted to invasionist models, which share common roots with eugenic interpretations and the racist approaches found in the Third Reich. Part of the problem is a failure to understand the historiography of archaeological interpretations. I do not accuse the geneticists of deliberately following these extremist approaches; none-the-less the vocabulary and concepts used endanger the misuse of genetics for racist ends. In this paper I want to look at how the later models can be used to modify the language and concepts of how genetic change takes place, and how it might relate to different aspects of cultural change such as language and material culture.

2 REVIEWING EVIDENCE FOR EARLY FARMER MIGRATION FROM SOUTHWEST ASIA TO EUROPE: AN OLD STORY WITH A TWIST

Author(s): Brami, Maxime (Palaeogenetics Group, Johannes Gutenberg University Mainz)

Presentation Format: Oral

Gabriel de Mortillet in 1879 was perhaps the first prehistorian to explicitly suggest an unbroken chain of 'neolithic' migration across Southwest Asia into Europe, based on the distinctly 'brachycephalic' shape of Neolithic-period skulls in the Swiss lake-dwellings and the distribution of domestic animals in Eurasia. This 'Alpine' man, who was thought to have originated in Central Asia, perhaps as far east as the Hindu Kush, the western slopes of the Himalayas, became the prototype of the European Neolithic farmer – a narrative which was later rebranded and passed on to the 20th century by V. Gordon Childe through the story of the neolithic 'revolution' (Childe 1936).

Fast forward eighty years and we are still searching for the great Neolithic migration across Asia, usually described as the 'spread of farming' and sometimes conflated with the expansion of the Indo-Europeans. We no longer believe that European agriculture originated in Central Asia, but all the evidence, from archaeobotany to ancient DNA and C14 dating unequivocally point to Southwest Asia as the cradle of Old World agriculture. Meanwhile, recent ancient DNA studies suggest that Central European farmers originated in Anatolia and only marginally admixed with indigenous hunter-gatherer populations – making Neolithic migrations, if not outright 'massive', at least decisive.

In line with the theme of the conference, this contribution will ask why we cannot escape the neolithic 'revolution' paradigm and the story of its great migration to the west. But we will see that there is a twist. Where we might have expected Southwest Asia to behave as a single gene pool for all Eurasian Neolithic farmers, current ancient DNA studies point to a split: Anatolian, Iranian and South Levantine farming populations are all clearly distinguished on the PCA of genetic diversity. Suddenly the chain of migration is broken and the picture becomes complex.

3 ANCIENT DNA, MATING NETWORKS, FAMILIES, AND MIGRATION IN THE PONTIC-CASPIAN STEPPES DURING THE EVOLUTION OF THE YAMNAYA CULTURE

Author(s): Anthony, David (Hartwick College)

Presentation Format: Oral

Ancient DNA has made it possible to identify a new class of human relationships: mating networks. I use the term 'mating network' for genetically linked populations that shared a distinctive group of genetic traits as determined by ancient DNA (aDNA) analyzed across whole genomes, such that individuals from that chronological period and part of the world can confidently be assigned to one mating network rather than another. In the Pontic-Caspian steppes five mating networks relevant to Yamnaya origins can be defined through ancient DNA studies: North Caucasus piedmont, Volga-Don-Caucasus steppes, Dnieper steppes, forest zone, and Danubian agriculturalist. One of these, in the Volga-Don-Caucasus steppes, makes the best candidate for the genetic ancestors of the Yamnaya population of the late 4th/early 3rd millennium BC. Within this mating network we can now tease apart family relationships within and between cemeteries on the Volga and observe the gradual co-evolution of the cultural traits that defined Yamnaya. The Yamnaya migrations of the 3rd millennium BC were preceded by shorter-distance movements that made steppe societies familiar and comfortable with long-distance mobility.

4 GENES, DISEASES AND MIGRATIONS: WHAT RELATIONSHIP?

Author(s): Kristiansen, Kristian (University of Gothenburg)

Presentation Format: Oral

Recent results from DNA has revealed a more complex picture of the causes and processes of migrations into Europe. Here I discuss this evidence in addition also the accumulating evidence of violence It appears that there are different forms of migrations during later prehistory, with results culturally and genetically.

5 BELL BEAKER: MIGRATION OR SOCIAL, CULTURAL AND ENVIRONMENTAL TRANSFORMATIONS IN NW EUROPE BETWEEN 2600 AND 1800 BC

Author(s): Kleijne, Jos (SFB 1266 Scales of Transformation)

Presentation Format: Oral

In this presentation I will present the results of my research into the Bell Beaker phenomenon from the perspective of a social network of innovation. By combining both social network theory and innovation theory, I see regional developments in how communities around the middle of the 3rd millennium BC embrace the Bell Beaker phenomenon. Pottery frequencies and Bayesian modelling show the varying pace and impact of the Bell Beaker adoption process: some communities adopt rapidly, whereas

others respond more slowly or completely reject the Bell Beaker phenomenon. The social mechanisms behind this process are perceived through networks of information exchange, based on similarities in settlement material culture. Here we see that there is a relationship between fast adopters versus slow adopters and the respective structures of their regional exchange networks. In conclusion, I will present a model that combines these social networks of information exchange with the evidence for mobility of persons and objects.

6 GENOMIC INSIGHTS INTO 3RD MILLENNIUM B.C. BOHEMIA

Author(s): Papac, Luka (Max Planck Institute for the Science of Human History, Jena) - Ernée, Michal - Dobeš, Miroslav (Institute of Archaeology, Czech Academy of Sciences, Prague) - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena; Faculty of Biosciences, University of Jena) - Schiffels, Stephan - Haak, Wolfgang (Max Planck Institute for the Science of Human History, Jena)

Presentation Format: Oral

Beginning in the 3rd millennium B.C., the genetic makeup of ancient Europeans shows increasing affinity to contemporaneous individuals from the Eurasian steppe. This 'steppe ancestry' component subsequently spreads to every corner of Europe and is today a major component of the ancestry of most extant Europeans. In order to shed further light on the timing, dynamics and consequences of the introduction of this 'steppe ancestry' into central Europe, we analyse genomic capture data from 136 Late Neolithic and Early Bronze Age individuals from 15 sites in central Bohemia. We find that, despite the sites being geographically close to one another, individuals are heterogeneous in relation to their local hunter-gatherer ancestries. Interestingly, we identify a possible admixture cline between our Late Neolithic Bohemian individuals and a source with high Eastern hunter-gatherer related ancestry, currently best represented by Lithuanian Neolithic individuals of the Narva culture. We first detect the presence of 'steppe ancestry' in individuals precisely dated to 2,900 BC found in Corded Ware archaeological contexts. Early carriers of this 'steppe ancestry' can be found buried in close proximity to individuals without 'steppe ancestry' at the same burial site. The genetic makeup of later Bell Beaker and Bronze Age individuals can be explained as mixtures of preceding Late Neolithic populations and a significant proportion of incoming steppe-related ancestry. We also detect a number of interesting outlier individuals which add to our understanding of the dynamics and regional nuances of population interactions in 3rd millennium B.C. central Europe.

7 MOBILITY AND MIGRATION AMONG THE BEAKER PEOPLE OF BRITAIN

Author(s): Parker Pearson, M. (University College London) - Sheridan, Alison (National Museums Scotland) - Evans, Jane (British Geological Survey) - Jay, Mandy (University of Durham) - Richards, Michael (Simon Fraser University) - Montgomery, Janet (University of Durham) - Pellegrini, Maura (University of Oxford)

Presentation Format: Oral

The Beaker People Project, recently published in 2019, is a multi-isotope study, combined with human osteology, dental microwear analysis and radiocarbon-dating, carried out on 334 burials of the Beaker period and Early Bronze Age (c.2500-1500 cal BC) in Britain, to explore patterns of mobility, migration, diet and health. Its results indicate that at least 40% of these individuals were buried in a region different to where they grew up. Whilst many of these may well have moved relatively long distances in their lifetimes, the famous Amesbury Archer, with his apparently long-distance migration from continental Europe, is atypical of the overall pattern of mobility. Whilst recent studies of aDNA of Beaker people reveal evidence of migration from Europe to Britain, most of the isotope data are likely to relate to shorter movements within Britain of descendant later generations of first-generation cross-Channel immigrants. Thus the isotope evidence provides a different measure of mobility and migration to the aDNA evidence. Much of the isotope-identified mobility may have related to mobile subsistence practices rather than to long-distance marriage exchanges or migration per se.

8 MULTI-ISOTOPIC APPROACHES TO HUMAN MOBILITY DURING THE LATE PREHISTORY OF EUROPE IN SOUTHERN IBERIA

Author(s): Díaz-Zorita Bonilla, Marta (University of Tübingen) - Aranda Jiménez, Gonzalo (University of Granada) - Bartelheim, Martin (University of Tübingen) - Beck, Jess (University of Cambridge) - Chala-Aldana, Döbereiner (University of Tübingen) - Díaz del Río, Pedro (Instituto de Historia, CSIC) - Escudero Carrillo, Javier (University of Tübingen) - Knipper, Corina (Curt-Engelhorn-Zentrum Archäometrie) - Sánchez Romero, Margarita (University of Granada)

Presentation Format: Oral

Understanding past human mobility is key to understanding the complexity of prehistoric sites. During the 3rd millennium BC large human aggregations appeared in southern Iberia. Different funerary patterns, including vast amounts of commingled human remains, create true palimpsests that make interpreting the archaeological record for this period challenging. Therefore, specific sampling strategies based on the MNI should be defined according to the preservation of remains in order to investigate site formation processes and mobility patterns.

This research incorporates multiple different methods that have been employed to investigate mobility patterns such as strontium isotope ratios ($87\text{Sr}/86\text{Sr}$) and stable isotopes of oxygen ($\delta^{18}\text{O}$) in combination with AMS radiocarbon dating. In this paper, we propose a specific sampling strategy that relies on bioarchaeological remains and includes human, faunal and environmental samples. Such a strategy is crucial to develop an understanding of the local bioavailable $87\text{Sr}/86\text{Sr}$ signature, and is also key

for contextualizing and clarifying site chronologies. For all of the sites analyzed, our results showed great inter-site variability, revealing different mobility patterns and economic strategies which may correspond to regional adaptations.

9 THE CONTRIBUTION OF ART TO THE STUDY OF PREHISTORIC MOBILITY

Author(s): Diaz-Guardamino Uribe, Marta (Durham University)

Presentation Format: Oral

This paper aims to highlight the various ways in which art, including rock art, sculpture and portable art, can inform the study of cultural mobility in late prehistoric Europe. Archaeologists studying hunter-gatherer societies across the globe, including Paleolithic Europe, have long recognized 'art' forms as valuable sources for the study of cultural mobility, and have developed advanced methodologies and theories in accordance to this. For late prehistoric Europe, however, during the last few decades, prehistoric art has rarely been considered as a useful tool or valuable source of data for exploring mobility, being frequently relegated to the realm of epiphenomena. Perhaps, this may have emerged as a reaction to Marija Gimbutas' excessive, and methodologically weak, interpretations, or as the result of ideas linking Neolithic, Bronze Age and Iron Age communities with stability, territoriality, boundedness and, at times, isolation. But nowadays it is recognized that late prehistoric communities in Europe could be highly connected, fluid and/or mobile, while being linked to tradition and place. In this context, the rich late prehistoric rock art, sculptural, and portable art traditions found in Europe have much to offer for the investigation of the mobility of people, things and ideas, especially when examined within new theoretical frameworks, with new methodologies, and in combination with other lines of evidence. I will present various case studies to illustrate this.

10 THE BRONZE AGE OF SOUTHWESTERN IBERIAN PENINSULA - ENDOGENOUS EVOLUTION VERSUS MIGRATION STIMULI

Author(s): Melo, Linda (Laboratório de Pré-história, CIAS, Departamento Ciências da Vida, Universidade de Coimbra) - Baptista, Lídia (Centro de estudos de Arqueologia, Artes e Ciências do Património; Arqueologia e Património, Lda) - Mataloto, Rui (UNIARQ; Câmara Municipal do Redondo) - Valério, Pedro (Instituto Superior Técnico, Universidade de Lisboa) - Silva, Ana Maria (Laboratório de Prehistória, CIAS, Departamento de Ciências da Vida, Universidade de Coimbra) - Soares, António Manuel (Universidade de Lisboa)

Presentation Format: Oral

Geographically, the Bronze Age of Southwestern Iberian Peninsula encompasses the Portuguese South, the province of Huelva and part of that of Badajoz. In recent years, our knowledge about the pre and protohistoric archaeology of the Southwest, complemented by archaeometric research of various types, has undergone an enormous increase. This research has been showing that, during the Bronze Age, a dispersed settlement is a recurrent trace. Only by the end of the 2nd millennium BC, during the Late Bronze Age, fortified settlements appear. Moreover, Bronze Age burials occur in a wide variety of structures, namely in stone cists (isolated or forming part of a necropolis), pits, hypogea, and also in reuses of collective funerary monuments of Neolithic or Chalcolithic chronology. Pottery shapes, where carinated vessels and burnished surfaces are usual, appear to undergo a weak evolution over Bronze Age times. The copper based metallurgy, characterized by arsenical coppers, also does not show a great evolution, as bronze only become common during the Late Bronze Age, despite the existence of some earlier evidence of its production and use. Similar situation occurs with noble metals (gold and silver) - native sources are commonly used and only by the end of the period artificial alloys are manufactured. Nevertheless, some contacts or some trade (exotic materials) with other peninsular regions or even with the Mediterranean area are visible in the archaeological record, mainly at the beginning and at the end of this whole cultural period. Although DNA studies are only beginning for the Southwestern Bronze Age, the current archaeological evidence does not seem to indicate the existence of relevant migrations, but rather an endogenous evolution of the communities that inhabited this region of the Iberian Peninsula, despite the rupture with the Neolithic settlement pattern detected at the beginning of the 2nd millennium.

11 SWORDS, METAL SOURCES AND TRADE NETWORKS IN BRONZE AGE EUROPE

Author(s): Ling, Johan (Department of Historical studies, UGOT) - Grandin, Lena - Hjärthner-Holdar, Eva (The Archaeologists, National Historical Museums) - Melheim, Anne- Lene (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

A comprehensive provenance study of nearly 120 Bronze Age swords, comprising lead isotope and trace elemental data for swords from Scandinavia, Germany and Italy dated between 1600 and 1100 BC, will be presented. European Bronze Age swords were items with high functional and symbolic value and therefore a very interesting case for approaching the question of metal trade in Bronze Age Europe. Often, a correspondence between metal supplies and artefact type/style has previously been assumed. The current study shows, on the contrary, that metal supply and sword brands were mostly unrelated. The chronology and geography of the deposited swords indicate that the different regions relied on different metal trade routes, and that these changed during the course of the Bronze Age. The largest variation in metal supply is seen during 1600-1500 BC, when copper ores in Wales, Austria as well as Slovakia constituted the major copper sources for the swords, however, unevenly distributed among the regions. Around 1500 BC, copper mines in the Italian Alps became the main supplier for the Scandinavian and Italian swords while swords from Germany were foremost based on copper from Slovakia and Austria. However, during 1300-1100 BC the sources in the Italian Alps became the dominant supplier of copper for the swords in all regions accounted for here. There

seem also to be a possibility that copper from southern Iberia makes its appearance among a few of the Scandinavian swords during this phase. Potential trade routes and trade networks will also be discussed in the light of the shifting sources of copper to Scandinavia.

12 MOBILITY OF MATERIALS AND PEOPLE IN THE IRON AGE EUROPE

Author(s): Danielisova, Alzbeta (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Strnad, Ladislav - Trubač, Jakub (Charles University in Prague, Faculty of Science)

Presentation Format: Oral

Iron Age, or the La Tène period (4th - 1st century BC), is usually perceived as highly “mobile”, in the sense of historical narrative: 1) so called “Celtic expansion” in the 4th and 3rd centuries that should have involved especially the personal mobility, 2) intensive political and economic contacts across wide European territory during 2nd and 1st centuries BC, that have been explained by the significant expansion of the contact network. However, archaeological record and namely the exact data give a rather confused picture. While, during the period in question, we have recorded several both cultural and socio-economic changes (new materials, introduction of coinage, change in burial customs), our data are extremely difficult to interpret in relation to addressing these paradigms. We have decided to approach the question of “mobility” in the Iron Age through the study of materials. Especially copper alloys, in the form of jewellery and personal or prestigious items, have been accompanying people throughout their lives. Exact data on trends in using these materials are solid part of the archaeological narration and their importance is therefore indisputable.

Through mobility of materials and/or artefacts studied by provenance analyses and mixing models we can examine socio-economic and cultural processes behind them, and establish theoretical frameworks also for the mobility of people. Our methodology involves evaluation of bulk and trace composition, accompanied by isotopic (namely Sr, Pb) tracers. Even in periods when traditional provenance questions are much more difficult to answer, we believe that even the mixing of sources tends to follow certain trends that can be traceable by available analytical methods. By establishing these “trends” historical events related to “mobility” can be explained. By examples from the individual case studies we will demonstrate our methodological approaches to mobility of both people and materials during the course of Iron Age.

13 NORTHERN EXPOSURE – ROMAN PERIOD MIGRATIONS AND CONNECTIONS BETWEEN ESTONIA AND FINLAND

Author(s): Moisiu, Jussi (University of Turku, Department of Archaeology)

Presentation Format: Oral

The end of the Pre-Roman and the beginning of the Roman Period is a transformative phase in the Finnish Iron Age as new burial traditions and material wealth appears in the coastal region of Finland. These have been interpreted partially as close connections across the Baltic Sea, but also as a sign of the arrival of migrant groups from Scandinavia and Estonia. The southern connection is particularly interesting, because Estonian tarand cemeteries have been found sporadically from a coastal region of Finland, which extends from the Gulf of Finland to the northernmost part of the Bothnian Bay.

In previous studies the tarand tradition has been straightforwardly connected to a migration from Estonia and relatively little attention has been placed on the relations between the migrants and the local population living in these areas. This question is particularly interesting, because in many sites the tarand burials appear alongside other burial forms. Weapons also form a dominant group among the grave goods, which is uncommon in Estonia.

Uncremated bones from the Iron Age have rarely preserved in Finland, but tarand cemeteries form an exception to this rule and remains of dentition and bones have been found from a number of sites. By utilizing aDNA and stable isotope analyses it is possible to bring new light on the issue of the origin of the migrants, the scale of the migration and how the relations between the local population and the migrant groups developed over the course of the Roman Period.

91 BIOARCHAEOLOGICAL APPROACHES TO UNDERSTANDING THE LONG-TERM DEVELOPMENT OF MOUNTAIN SOCIETIES

Theme: Archaeology of mountainous landscapes

Organisers: Walsh, Kevin (Dept of Archaeology University of York) - Giguët-Covex, Charline (EDYTEM CNRS/Université de Savoie) - Kowarik, Kerstin (Naturhistorisches Museum, Wien) - Mocci, Florence (Centre Camille Jullian UMR 7299 CNRS/Univ Aix-Marseille) - Knockaert, Juliette (Dept of Archaeology University of York)

Format: Regular session

The last ten years have seen significant developments in archaeological science, more specifically within Bioarchaeology and palaeoenvironmental science (aDNA, isotopes, proteomics, lipid analyses etc.). Within mountain archaeology, these innovative methodologies have started to transform our understanding of the complex networks of economic and cultural activities, the mobility of people and animals and thereby, the web of human-environment interactions that operated across different temporal and spatial scales.

Prior to the emergence of these techniques, research across the higher altitudinal zones, in particular, was limited, due, in part to assumptions and preconceptions that characterised mountain areas in general and especially the higher altitudes as zones of

marginal importance. Research projects that developed during the 1990s and 2000s have changed our understanding of mountain landscapes. More recently, the emergence of new bioarchaeological techniques has greatly facilitated our ability to engage with complex questions and theoretical nature relating to mobility, variations in diet and economy, heterogeneous landscape trajectories. In this session, we hope to consider how these methods inform our understanding of a wide range of human practices and activities in mountain environments: from the development of short and long-distance transhumance, mining, trade and exchange, human mobility and changes in diet and health. In addition, we wish to consider how these activities, combined with the complex phases of climatic change, affected mountain environments. We aim to attract contributions from colleagues who work within in both low altitude/valley-bottom zones as well as those researching the higher-altitudinal areas.

This session will aim to involve colleagues working in mountain ranges. Although our aim is to consider the application of bioarchaeological methodologies, as suggested above, we also wish to include contributions that deal with theoretical frameworks that address issues relating to human and animal mobility, socio-ecological trajectories, and the evolution of environmental knowledge in mountain environments.

ABSTRACTS

- PASTORAL HISTORY IN ALTITUDE IN THE FAUCIGNY MASSIF (NORTHERN FRENCH ALPS): AN HISTORY TOLD BY ARCHAEOLOGISTS, HISTORIANS AND PALAEOENVIRONMENTALISTS**
Author(s): Giguet-Covex, Charline - Blanchet, Claire (EDYTEM) - Guffond, Christophe (Unité d'Archéologie-Conseil départemental de la Haute-Savoie) - Mélo, Alain (Recherche et Valorisation des Patrimoines Historique) - Bajard, Manon (University of Oslo-Department of Geosciences) - Rey, Pierre-Jérôme - Messenger, Erwan (EDYTEM)
Presentation Format: Oral
Mountainous people often developed pastoral activities taking advantage of the altitudinal gradient. In the French Alps, our knowledge of the history of high-altitude pastures is mostly based on palaeoecological, historical and archaeological researches. With the emergence of molecular biological tools applied on lake sediments, it was possible to identify and reconstruct the history of the animals who grazed in high-altitude. In this paper, we combine these approaches to document the pastoral history of three catchments located in the Faucigny Massif (Gers, Anterne and Sales).
Our results show that the first important development of pastures date back to the Late Iron Age at Anterne (sheep and cow DNA) and the Roman Period at Gers (cow DNA). At Anterne, a shepherd's hut dating to this period with sheep bones was also discovered by the archaeologists. These activities had a significant impact on soil erosion, which might partly explain the decline of these activities after the Roman Period. From the 11th century, the activities intensified, with sheep and cows at the beginning and then, especially cows. The timing of this change differs from site to site (13th- 16th centuries). At Gers, goat DNA was also detected (11th to 14th and 16th to 19th centuries). Below the lakes Laouchets, several huts and enclosures were dated to the 12th-14th and 13th-15th centuries. Archaeological excavations have uncovered bones from cows, sheep and pigs. Other huts, documented on the Mappede Sarde, were occupied during the 18th and 19th centuries. Historical archives tell us that several families with some livestock lived there and shared the pastures. This mode of exploitation is different from the other sites where only one shepherd seems to have been in charge of the animals.
- TRACKING VERTICAL MOBILITY AND SHEEP HUSBANDRY PRACTICES IN THE NORTH-WESTERN ALPS (SWITZERLAND): A MODERN ISOTOPIC INVESTIGATION**
Author(s): Knockaert, Juliette (Department of Archaeology, University of York) - Chiquet, Patricia (Unité d'anthropologie, University of Geneva) - Walsh, Kevin (Department of Archaeology, University of York) - Pike, Alistair (Department of Archaeology, University of Southampton) - Fiorillo, Denis - Balasse, Marie (UMR 7209, Muséum national d'Histoire naturelle of Paris)
Presentation Format: Oral
The investigation of domestic animal management is crucial for understanding the development of mountain societies and the evolution of the mountain landscapes. Pastoral activities, notably, have contributed to the development of landscapes since the Neolithic. During the last decades, the use of isotope analyses, especially strontium, oxygen and carbon isotopes, have been widely exploited by the bioarchaeological community in order to assess past transhumant-pastoral activities. However, only a few studies have investigated this issue on modern livestock under controlled conditions. In this paper, we will consider the tracking of short-distance vertical mobility and husbandry practices on modern transhumant sheep in the North-western Alps via a multiple isotopic approach ($^{87}\text{Sr}/^{86}\text{Sr}$, $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$). The isotopic study includes enamel from several teeth and considers the plants consumed by animals from lowland and high-altitude grazing areas. The results allow us to discuss methodological challenges, the potential and limitations of using isotopic tools on this research target.

3 LIVESTOCK MANAGEMENT AND HERDING STRATEGIES ON AN ALPINE SITE DURING MEDIEVAL AND MODERN PERIODS BY ZOOARCHEOLOGY, PROTEOMICS AND ISOTOPIC ANALYSES

Author(s): Knockaert, Juliette (Department of Archaeology, University of York) - Lebole, Chiara - Di Gangi, Giorgio - Mascarello, Chiara (Dipartimento di Studi Storici, University of Turin) - Sartorio, Gabriele (Patrimonio Archeologico, Aosta) - Pike, Alistair (Department of Archaeology, University of Southampton) - Orton, David - Walsh, Kevin (Department of Archaeology, University of York)

Presentation Format: Oral

The Petit Saint-Bernard Pass is an important node of communication in the Western Alps but has also been a pastoral area since the late Neolithic. According to palaeoenvironmental analyses, an intensification of the pastoral activities around the pass appears during the Medieval and Modern periods. Recent excavations on the alpine site of Orgères (1665 a.s.l., Vallon des Chavannes- Italy), located on an alternative route between France and Italy to that offered by the Petit-Saint-Bernard Pass, revealed two main occupation phases: the medieval (VIII-XVe centuries) and post-medieval (XVII-XVIII centuries) periods. Supra-regional and transalpine interaction, based on the trade of dairy products, would have linked lowland urban sites with those at higher altitudes. Within this network, the exogenous origin and/or seasonal mobility of the domestic livestock could be considered.

The study of the faunal remains represents a rare opportunity to assess the livestock management and herding strategies in a high-altitude settlement, located in a pastoral landscape. For this purpose, we combine zooarchaeology, molecular techniques, including ZooArchaeology by Mass Spectrometry (ZooMS) and isotopic analyses.

The zooarchaeological study has highlighted important breeding activities; mainly focused on the exploitation of caprines. The distinction between sheep and goat is crucial to characterise the specific composition of the livestock and the associated production strategies. This has been investigated by the anatomical criteria and the peptide fingerprinting characterization (ZooMS) of bone collagen. Because the study area is characterized by a mosaic of geological substrates of various ages and a large altitudinal gradient, the vertical mobility of the domestic caprine can be tested by oxygen and strontium isotopic analyses.

This research adopts a diachronic approach and incorporates local paleoenvironmental data, the results allow us to discuss the continuity and changes of the herding strategies in an alpine location and contribute to the understanding the long-term development of mountain societies.

4 TRACING LIVESTOCK FARMING IN EASTERN PYRENEES FROM THE NEOLITHIC TO THE PRESENT: A COMBINED ARCHAEOBIOLOGICAL AND PALAEOENVIRONMENTAL APPROACH

Author(s): Colominas, Lidia (Catalan Institut of Classical Archaeology) - Giguët-Covex, Charline (Edyta Laboratory) - Ejarque, Ana (MSH-Geolab UMR6042) - Euba, Itxaso - Orengo, Hèctor - Palet, Josep Maria (Catalan Institut of Classical Archaeology)

Presentation Format: Oral

The reconstruction of livestock practices in high mountain areas is important for understanding the integration of these spaces into the economy of ancient societies. However, it is often challenging to characterize this activity due to the poor preservation of archaeological remains in these extreme and sensitive environments. Over the last decade, multidisciplinary landscape archaeology combining archaeological and palaeoenvironmental analyses have allowed documenting both the long-term occupation and landscape impact of ancient pastoral societies in the eastern Pyrenees. However, many open questions on highland husbandry remain yet open such as the animal and/or by-products exploited. To bypass these limitations, here we propose to apply a multidisciplinary approach that encompasses not only Archaeozoological, Anthracological and Palynological studies, but also lake sediment DNA analyses into the study of livestock practices in the Madriu valley (eastern Pyrenees). The ultimate interrelation of all these data and their contextualization with the archaeological livestock structures documented in the area, will allow us to better evaluate and characterise the importance and fluctuations throughout history of this economic activity.

5 TALES OF RESILIENCE FROM THE SWAT VALLEY, PAKISTAN

Author(s): Nayak, Ayushi (Max Planck Institute for the Science of Human History) - Olivieri, Luca (ISMEO) - Boivin, Nicole - Roberts, Patrick (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

Located at an elevation of over 3000 feet, the Swat Valley is nestled between the Hindukush mountain range. The region has long been recognised as a frontier, buffering interactions between South and Central Asia. Owing to its geographical location, the Swat Valley has gained significance as a crossroads, showing archaeobotanical, zooarchaeological and human evidence of movements in the past. The first evidence of agriculture of Southwest Asian domesticates dates to at least the 4th millennium BCE, while South Asian domesticates are adopted from the 1st millennium BCE. In other words, the Swat Valley presents itself as a case study not only as a palimpsest of high altitude societies, but also as a frontier of interaction between the cultural phenomena of South and Central Asia. Moreover, the geographical and ecological features distinguish the region as a refuge in an otherwise hostile, mountainous environment. Here we present stable isotope data from faunal and human remains from various sites in the Swat Valley spanning a millennia. Our data provide multi-scalar, multi-proxy, cross-temporal insights into resilience in the region and shed light on how these mountain societies developed through time in the face of inter-cultural influx.

6 LOCAL ENVIRONMENTAL KNOWLEDGE AND THE PROCESS OF MARGINALISATION OF MOUNTAIN AREAS SINCE THE 18TH C.: AN ARCHAEOLOGICAL PERSPECTIVE

Author(s): Stagno, Anna Maria (University of Genoa, Laboratory of Environmental Archaeology and History - DAFIST-DISTAV)

Presentation Format: Oral

Even if, archaeology and environmental archaeology their capacity to reconstruct how rural areas, and in particular mountains, were managed from prehistory until the present, excluding the well-studied British "enclosure" process, the jurisdictional dimension of environmental resources management practices, which was a key dimension at least until the end of the Old Regime, is one of the less considered in the archaeology of recent periods. The investigation of the double nature of resource management practices as 'technical facts' and 'legal facts' is central for deciphering changes in the management of mountain areas, above all during these last centuries, when central authorities promoted deep changes in the environmental resources management practices, forbidding multiple uses and changing the rules of the access rights to commons and of the co-sharing of resources. However, a few archaeological attempts have been made to study the consequences of Capitalism rural Southern Europe. The paper aims to focus on the study of practices and their changes in the last three centuries, with the aim to decipher what the process of marginalisation of mountain areas was and is. Thanks to archaeobotanical (pollen, NPP's, phytoliths, charcoal) and geochemical analyses of soils and sediments, present vegetation observation and artifacts survey, archaeology can shed light on: - phenomena that can be lost in generalisations made from written sources; - the local environmental knowledge which sustained the management of environmental resources, and which still need to be identified; - in addition, studying and collaborating with present societies, archaeology can bring to light criticisms of the current protections and policies applied to mountain areas, demonstrating the fragility of their heritage and the extent to which its conservation depends upon the hidden social and historical dimensions of environmental resource management.

7 DENDROARCHEOLOGY OF THE ROYA'S VALLEY (FRENCH ALPS) : SUBALPINE CONSTRUCTION, TIMBER AND FORESTS DURING THE SECOND MILLENIUM OF OUR ERA

Author(s): Labbas, Vincent (TRACES UMR 5608, University of Toulouse)

Presentation Format: Oral

This paper aims to bring new knowledge on a subalpine territory, the Roya small valley, in the Southern Alps in the long term, specifically since the Middle Ages. This little territory is located between 1400 and 2800 meters in the Mercantour massif.

Timber is widely used in agropastoral buildings. Therefore, the main approaches in this case are dendrochronology and archaeology. The dialogue between them delivers a new look at the medieval and modern habitat in the mountains.

The main question is the chronology of subalpine constructions, mainly agropastoral barns but also houses. The question of construction practices is also at the heart of this research. The last question raised by this study is the link between human populations and forests.

Dendroarchaeological records deliver a long tree-rings chronology from the end of 10th century to early 20th century. They also give evidence of an elevated frame of which the oldest still preserved witnesses are dated from the 13th century. This research also reveals construction practices based on the systematic reuse of timber over a long period. The last result informs that if one sees heterogeneous forest landscape trajectories according to the different areas of the valley, one sees a gradual decrease in the age of the trees slaughtered over time (13th - 20th century).

Bioarchaeological informations also provide results on the mobility of raw materials for buildings. Dendrochronology also helps to perceive different forest sources in timber used in the same building. This dendroarchaeological reading of the subalpine construction makes it possible to question the origin of raw materials on a mountain territory at a micro-scale. This research, that addresses the bioarchaeological angle thanks to the interannual resolution of Tree-rings, wishes to question a possible dendro-isotopic approach to refine timber origin.

A. MOBILE MOUNTAINS EARLY NEOLITHIC SOCIETIES THROUGH THE INTEGRATION OF ZOOARCHAEOLOGICAL AND ISOTOPIC ANALYSES: THE FONT MAJOR CASE (CATALONIA)

Author(s): Messana, Chiara (Universitat Rovira i Virgili - URV, Àrea de Prehistòria; Institut Català de Paleoecologia Humana i Evolució Social - IPHES) - Martín, Patricia (Seminari d'Estudis i Recerques Prehistòriques - SERP, Facultat de Geografia i Història, Universitat de Barcelona) - Tornero, Carlos - Vergès, Josep Maria (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Universitat Rovira i Virgili - URV, Àrea de Prehistòria)- Fontanals, Marta (Universitat Rovira i Virgili - URV, Àrea de Prehistòria; Institut Català de Paleoecologia Humana i Evolució Social - IPHES)

Presentation Format: Poster

The cova de la Font Major site, where the River Francolí is born, is located on the foot of the eastern slope of Prades hills (L'Espluga de Francolí, Catalonia; 411 m. a.s.l.) and turns out to be a natural way of communication between the coast and the internal area. During the Early Neolithic period the site was occupied and, supposedly, the settlement would be used as an overwinter valley-bottom location of a short-distance vertical movement directed towards the highest altitudes of the Prades mountains (highest peak: 1202 m.). The aim of the present research project is to study past pastoral communities of the Font Major site based on the management and exploitation of mobile livestock, specifically caprine. The integration of osteological and biochemical analyses will help us to confirm or deny, through direct evidence, the interpretations derived from the most traditional

archaeological approaches and will provide new valuable cultural, socio-economic and environmental data. The information derived from the analyses of the faunal remains will concern the composition of mobile livestock (species, age, sex), the annual reproductive dynamics, the seasonal feeding habits and the annual mobility patterns. The results will give a seasonal temporal resolution, which is the only possible way to understand the occupation dynamics of ancient pastoral communities based on the management and exploitation of mobile livestock. The biochemical data obtained from archaeological caprine bones and teeth remains will be compared with those obtained from modern sampled herds, which will be used as a baseline for interpreting the final results. The referential specimens belong to the Mas d'en Pepet pen (Rojals, Prades mountains; 880 m a.s.l.), a long-term experimental program promoted by IPHES on the Prades hills since 2014. Data from archaeobotanical and micromorphological analyses of the dung deposits on this pen is used to strengthen final interpretations.

94 WORKING WITH CERAMICS IN THE 21ST CENTURY

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Hall, Derek (Stirling University) - Witte, Frauke (Museum Sønderjylland) - Regner, Elisabet (National Historical Museums Stockholm)

Format: Regular session

The study of ceramics has the ability to reconstruct a staple part of everyday life across many periods but is it being properly re-sourced? Across Europe the problems of storage and display of such material are becoming greater largely due to the pressures of funding and changes in focus. Are we now at a point where specialist decisions need to be made on site as to what should be kept and what should be discarded? If so on what basis should such choices be made? How accessible are existing collections of pottery for research and more to the point is adequate training in place to ensure that such research can take place both now and in the future? This session will consider these issues from the point of view of both excavated assemblages of pottery and existing curated collections. Consideration will also be given to the need for common standards in both the naming of fabrics and their accessibility in museum collections. Scientific analysis (both chemical and petrological) is now becoming more widely used in the study of ceramic materials and thought needs to be given as to how best to share the results and data so that everyone working in the field can use it. The session organisers would like to invite contributions from across Europe covering all periods of ceramic research and display.

ABSTRACTS

1 SPATIAL AND CHRONOLOGICAL ASPECTS OF CERAMIC TRADITIONS DURING LATE BRONZE -EARLY IRON AGES OF THE PONTIC SEA REGION

Author(s): Kulkova, Marianna (Herzen State University; Peter the Great Museum of Anthropology and Ethnography - Kunstkamera, Russian Academy of Sciences) - Kashuba, Maya (Institute for the History of Material Culture, Russian Academy of Sciences) - Vetrova, Maria - Kulkov, Alexander (Saint Petersburg State University) - Gavrylyuk, Nadezhda (Institute of Archaeology of National Academy of Science of Ukraine) - Kaizer, Elke (Institut für Prähistorische Archäologie Freie Universität Berlin)

Presentation Format: Oral

In the period of 11.–8. cc. BC the first technology of iron production appears on the territory of Carpathian-Danube basin and Northern Black Sea Region. One of indicators of this innovation is changes in ceramic technology also. The pottery is characterized by high quality, thinness of walls, the polished black surface ornamented by inlay of white paste. The appearance of this type of ceramics is a marker of the Carpathian-Danube Early and Middle Hallstatt cultures. The carriers of those cultures migrated from the Middle and Low Danube region towards the eastern European forest steppe zone. The vessels so called the “Thracian” group have very distinctive features in comparison to local ceramics. The question about ways of a penetration of the “Thracian” ceramics toward steppe in the Northern Black Sea Region, the influence of new cultural traditions on the local cultures, the borrowing or conservation of technologies during the period and changes in economic organization of society has been not resolved yet. Ceramics in this case are a unique and the most informative materials. For investigations the samples of pottery from the archaeological sites of the Dniester basin (Glinjeni, Saharna, Soldaneshti, Selishte), of the Dnieper basin (Subbotiv, Zhabotin), of the Southern Bug basin (Nemirov, Diky Sad) and from burials situated on this territory as well the samples of mineral raw materials were collected. The technological features and composition of ceramics, white inlay and raw materials were studied in thin sections, by XRF-WD method, by SEM-EDS analysis. The m-CT method was used for porosity calculation and 3D visualization of voids inside of ceramic texture.

Acknowledgement: This research is supported by RFFB project № 18-09-40063, the Volkswagen Foundation, project № 90 216.

2 “FATE” OF CERAMIC COLLECTIONS AFTER PRIMARY PROCESSING FOR KEEPING IN MUSEUM

Author(s): Islanova, Inna (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Primary processing of ceramics found in settlements takes place during excavations or right off their completion. Main losses happen that time. In general, small fragments of ceramics are found on settlements.

A new group of antiques of the 2nd – 4th centuries in the forest zone of Eastern Europe was found recently. Before that the

researcher of the settlement which became model saved all the collection and published almost all the material. Relying on this collection it was possible to find analogous fragments of ceramics in other settlements and define the territory of a new cultural group. New finds were unitary because the expedition leaders were specialists in other periods and archaeological cultures. During the primary processing of collections, only ceramics of the cultures interesting those specialists were saved. Due to presence of holistic collection the "loss" of not taken ceramics almost did not change scientific conclusions.

During the excavations of a 6th – 8th century settlement all the ceramics were saved, even small fragments. Later it was possible to establish the contacts between the population of different cultures relying on those fragments differing from common massif.

Undoubtedly all ceramics from a general model settlement should be saved. These materials should be accessible to the researchers and published. Ceramics from secondary monuments can be not fully saved but it must be processed in detail (description, drawings, photographs, scanning). Individual forms and all materials, not characteristic for the type of antiques to which settlement belong, must be saved.

An informed assistant must do primary processing. Special handbooks are needed, in which must be: 1) detailed characteristic of ceramics from all known groups of antiques of the region; 2) problems of archaeological cultures studies. Also restorers of ceramics must know the information from such a handbook, especially the existence of individual forms.

3 THE ISSUES ABOUT ANALYSIS AND ASSESSMENT OF MEDIEVAL POTTERY IN CZECH REPUBLIC – CURRENT PROBLEMS AND FUTURE TRENDS

Author(s): Capek, Ladislav (University of West Bohemia)

Presentation Format: Oral

The issue deals with the general problems of analysis of pottery assemblages recovered from excavations of medieval sites in the Czech Republic and approaches of their processing and assessment. The analysis of medieval pottery is mostly based on the detailed characterization of ceramic fabrics, morphology of rims and decoration elements that are usually converted to alphanumeric codes which enter the database systems. For comparison of pottery assemblages, simple quantification methods, exploratory data analysis and multidimensional statistical methods (seriation, correspondence analysis, factor analysis) are used to create validated type-chronology. The phasing of ceramic horizons is based on the interaction of pottery dating elements and contexts (stratigraphic data). For the purpose of pottery studies, in the Czech Republic have been creating very detailed descriptive systems and database software based on different approaches to pottery analysis, differing between pottery specialists and institutions and that are not fully compatible with each other. For this reason, we can not carry out comparative research to study modes of pottery distribution between different production centers than in broader geographically defined regions. A certain solution is the creation of standards of pottery processing for project design and open descriptive systems, which is currently being developed within the framework of a project obtained from the Ministry of Culture of the Czech Republic. The project includes the creation of a digital archive (repository) with comparative medieval pottery collections and the archaeological 3D virtual museum that will make the result of the pottery studies available in the form of modern media and serve as methodological and educational support for pottery specialists and students.

4 ARCHAEOLOGICAL CERAMICS: FROM THE EXCAVATION TO THE EXPOSITION (MEDIEVAL RURAL MATERIALS OF THE EUROPEAN PART OF RUSSIA)

Author(s): Murentseva, Tatiana - Fatkov, Alexey - Anikin, Ilya (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

During the last years large-scale archaeological research is conducted on the territory of the European part of Russia. Increase in the number of archaeological objects is a new reality for archaeologists and museums.

Pottery complexes are not a complete archaeological source of information on their own. For the researcher the aim is to form this source.

We define the special cycle of preliminary works for this (based on work experience with ceramics of Russian medieval monuments). It is primary statistical processing of ceramics (by method of V. Koval) and analysis of their technological and morphological features, type of ornamental designs; grouping ceramics in accordance with different cultural traditions; detection of fragments from the same vessels, gluing and scientific reconstruction of entire forms; drawing and photography of unique vessel forms and their cross-sections; composing of generalizing tables with information about the whole variety of ceramics groups in quantitative and percentage ways, the distinctive features each of the groups and their correlation in different complexes from the settlement; dating of ceramics complexes; text description of all the ceramics materials' features.

After such processing the amount of ceramics decreases in 4 times. The structure of the identified complexes has to be preserved in the museum collections. So, an exact model of the total amount ceramics materials from the excavation is formed. Together with the information received by the researcher, it is already a complete archaeological source. This model guarantees the verifiability of this data for other scientists.

This optimization allows to transfer collections to the museum, despite the objective lack of storage space. The museum staff has to do only the specific museum restoration, storage and display of materials. The most attractive vessels are usually shown. So archaeological ceramics is used as a full-fledged source, and for the promotion of the archaeological heritage."

5 CERAMICS FROM PRAGUE CASTLE AND HRADČANY, CZECH REPUBLIC. THE CREATION AND PROCESSING OF CERAMICS: A 94-YEAR HISTORY

Author(s): Blažková, Gabriela (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Kloužková, Alexandra (University of Chemistry and Technology in Prague)

Presentation Format: Oral

The Institute of Archaeology of the Czech Academy of Sciences, Prague, has been conducting rescue archaeological excavations on the grounds of Prague Castle since 1925. During this time, an extensive collection of ceramics finds with thousands of ceramic vessels and hundreds of thousands of potsherds has been assembled. This collection was and is the foundation for the creation of the chronology of pottery in Prague from the Early Middle Ages up to the Early Modern period. From the very beginning of the archaeological excavations, full attention has been paid not only to early medieval finds but also to those of high medieval and Early Modern age. In the 1990s, it was the pottery finds from Prague Castle that were used to test the processing of pottery assemblages using pottery fabric. Vessels dated to the 16th and 17th century were the form the foundation for dating Early Modern pottery in Bohemia. And yet, learning about ceramics from an archaeological perspective, on the basis of macroscopic observations, has its limits. Efforts have been made in recent years to solve this problem in cooperation with the University of Chemistry and Technology in Prague. In the case of selected assemblages, attention is paid to analyses of the ceramic body, glazes and even the degradation of the pottery in connection with their deposition and the impacts of the surrounding environment. Today, many analytical methods common in material research are applied: for identifying the chemical and mineralogical composition, these are mainly X-ray methods (XRF, XRD) supplemented with microscopy (optical OM, electron SEM); still others are thermal analyses (DTA, TG, STA) and spectroscopy of vibrational spectra (IR, RS). However, in order to compare the results of the analyses and create databases, it is necessary to use the same analytical methods under similar measuring conditions.

6 LEX RIBE - FROM WRITTEN PROTOCOLS TO .NET

Author(s): Søvsø, Morten (Museum of Southwest Jutland)

Presentation Format: Oral

Archaeological excavations in Ribe, Jutland, began in the 1950's and have over the years created a collection of more than half a million artefacts of which ceramics make up c. 400.000 sherds.

The finds cover the time span from c. AD 700 until present day, but especially the finds from the first 500 years of the town's history are of international importance. During this time span Ribe was initially an important North Sea emporium (c. 700-1050) and later a likewise important High Medieval trading town (c. 1050-1250). During this half millennium, Ribe served as a trading hub connecting Scandinavia with Northern Europe and connecting international merchants with agricultural products from Denmark.

This wide array of trading contacts brought huge amounts of imported pottery into Ribe in the form of Badorf-, Tating- and Reliefbandamphor-wares followed later by Pingsdorf-, Paffrath-, Andenne-, Rouen- and Flemish-type wares and a bit of English pottery as well. In some periods, the imports make up to 25% of the pottery while the rest is greywares including small numbers of Muschelgrus-ware (Shelly-ware) and Slavonic-type pottery.

In 2006, we began a full retrospective digitization of the collections and as the information in the database grew, we moved the finds to our new purpose-built storage.

The paper presents the thoughts, results and modus operandi behind this big project, executed by a local, small to medium-sized Danish Museum with very little external funding. And claims, that it is possible, worthwhile and meaningful to collect pottery in huge numbers – at least from stratigraphic excavations in urban layers.

7 THE EHLERS COLLECTION. NORTHERN EUROPE'S LARGEST COLLECTION OF LOCALLY PRODUCED EARTHENWARE - POSSIBILITIES AND CHALLENGES

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

Presentation Format: Oral

The collection was established by Louis Ehlers (1916-1998) at the beginning of the 1930's with the purpose of documenting the history of Danish potters and preserving their earthenware for future generations. The collection covers a period from the Middle Ages until the 1940's, representing every region of Denmark and Schleswig-Holstein (Northern Germany).

The collection includes several thousand artefacts. Most of these are intact, exhibited, and available for scholars. The collection includes pots, dishes, plates, as well as toys, piggy banks, stove tiles and much more. The collection displays, especially, the dispersal of types of decorations in the different regions, with emphasis on pottery from the 16th to the middle of the 18th century. Opposite to archaeological finds, here is opportunity to see the objects as a whole. However, part of the collections oldest artefacts are finds with unknown archaeological contexts. As for the younger artefacts, the provenance and dating is often uncertain, and especially the provenance registered as the location where the artefact was obtained, instead of the use or production location. The lecture will give an introduction to the collection, and attempt to outline what it can be used for, and where its limitations lie.

8 MIXED METHODS? MAKING CERAMIC COLLECTIONS AVAILABLE IN A DIGITAL AGE

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

Presentation Format: Oral

Mixed methods research can be defined as research which combines qualitative and quantitative data to answer a given research question. Within archaeology, most research happily contains both types of data. However, digitization and the availability of more data and new types of data poses its own challenges in this type of research, and perhaps the mixed nature of archaeological data itself constitutes a challenge for digitization as well.

The archaeological collections of the National historical museums in Stockholm span most time periods from the stone age up to the 19th century and have been collected from the late 17th century onwards. Today, modern rescue archaeology provides the single most important mode of collection development as large amounts of archaeological finds are accessioned to the museum every year. Ceramics not only form a large part of the finds in our stores, but it is often a key finds category for both chronology and social interpretation.

In a digital age, our aim is to make these collections including ceramics available for research not just through visits to our stores but also through digitization. Retrospective documentation and digitization of the collections forms a large part of our collections management. We also provide as much contextual and other information from the excavation as possible. We make this information available online, open access.

But is this enough? Field collection practices can vary greatly from one excavation to another making quantitative analysis difficult. Consistently applied terminology from field collection to museum database remains a challenge. In this paper, I will address some of our experiences in making large quantities of data on ceramics available for research, and outline some of the challenges moving forward towards innovative, data-driven mixed method research based on archaeological ceramics.

9 EARLY MODERN CERAMICS IN GOTHENBURG - DEALING WITH LARGE UNPUBLISHED ASSEMBLAGES

Author(s): Wennberg, Tom (Museum of Gothenburg)

Presentation Format: Oral

The last century of archaeology in Gothenburg have resulted in extensive archaeological assemblages now being stored by the Museum of Gothenburg. The first half of this period created relatively small manageable materials. During the 70's new legislation in Sweden gave way of a new more methodological archaeology. This new legislation implied that every anthropogenic remains older than 100 years would be protected by law. The developer was financial responsible for the archaeological costs (or could choose to not develop). The legislation has since then changed, and protection are now fixed to not later than 1850, with some exceptions of protected remains of later age.

These large assemblages have piled up in the museum store, though to a larger degree published in conceptual excavations reports, seldom analysed at any deeper level. This paper will present and discuss an ongoing project of analysing and publishing an extensive archaeological ceramic material collected for over a century at the Museum of Gothenburg. The methods that will be discussed are primarily from a collection and archival point of view. The importance of knowledge-based networks in the new era of social media in combination with the importance of meeting face to face will be stressed. The experiences from the conference Gothenburg Ceramics 2019 will be used as a current example.

10 FROM EXCAVATIONS TO COLLECTIONS –WORKING WITH POTTERY AS A FINNISH FIELD ARCHAEOLOGIST

Author(s): Helamaa, Maija (Muuritutkimus Ltd.)

Presentation Format: Oral

Finnish field archaeology as well as archaeological collections have been under change for the past decade. The change is not only in the number of historical sites excavated but the excavations themselves are now being done mainly by the independent companies. This leaves the National Museum and couple of other archaeological collections the curators of growing collections selected by others.

This paper will shed light on work with pottery within the Finnish system as a field archaeologist. A large-scale urban excavation in Turku Market Square in Southwestern Finland in 2018 provides a main case study for the theme. Other projects by the same company, Muuritutkimus Oy, gives a wider perspective for the last decade.

What is the role for an independent company and its archaeologists as the first hand collector of the pottery (excavations) and cataloguing the finds using the museums' guidelines (databases, if there are any). Who handles the pottery during post excavation processes and with what kind of an education? Where to draw the line between the basic cataloguing as part of the excavation report and more detailed pottery studies?

The time span of historical archaeology has widened from few medieval centuries to early modern -modern periods and occasionally very recent times. Pottery that was discarded as too modern few decades ago is now being collected. Is there any way, or is there any need, to master all the material when new types emerge all the time?

11 RECOGNISING, STORING, AND SHARING. COULD AN APP SOLVE THE PROBLEM?

Author(s): Gattiglia, Gabriele - Anichini, Francesca (University of Pisa)

Presentation Format: Oral

Every archaeologist knows how pottery is of fundamental importance for the comprehension and dating of archaeological contexts, and for understanding the dynamics of production, trade flows, and social interactions. Today, two main obstacles have to be dealt with in archaeological studies of pottery: (1) the characterisation and classification of ceramics is carried out manually, through the expertise of specialists and the use of analogue catalogues held in archives and libraries; (2) the storage and display of a wider and wider amount of such material are becoming more and more difficult due to the insufficient space available both in archaeological storehouses and museums. The ArchAIDE project (archaide.eu), funded by the European Union's Horizon 2020 research and innovation programme, has developed a new app that aims to improve the practice of pottery recognition in archaeology, using the latest automatic image recognition technology. ArchAIDE supports the classification and interpretation work of archaeologists (during both fieldwork and post-excavation analysis) with an innovative app for tablets and smartphones, designed to be an essential tool for archaeologists. Pottery fragments are photographed, their characteristics sent to a comparative collection, which activates the image recognition system, resulting in a response with all relevant information linked, and ultimately stored, within a database that allows sharing online. The system currently supports shape-based recognition of Terra Sigillata and Roman Amphorae, and decoration-based recognition of Majolica of Montelupo and Majolica from Barcelona e Valencia, as a proof-of-concept. The possibility to digitally store all the information related to every single potsherd (fabric, location, etc.) together with images, drawings, 3D models, etc. could be a way for planning a new strategy for analysis, preservation and display of both digital and real potsherds.

12 CRETE: MEDIEVAL MATERIAL CULTURE ON DISPLAY; IS THAT ALL?

Author(s): Konstantinidou, Sonia (Sapienza Universita' di Roma)

Presentation Format: Oral

With a long-term history and a strategical geographical position, the island of Crete in Greece constitutes a reference point. While chronological range along with the quantity of archaeological data of the island are enormous, they are at the same time of great importance. The place's history is exhibited throughout museums as well as it is projected on various archaeological sites. In the museums which are placed in several parts but mainly in the capitals of Crete's four prefectures, ceramic vessels characterize a large amount of the existing curated collections. Indisputably, through each period's wealth of findings, it should be reflected the timelessness of Cretan civilization. At the same time though, all this information should and could be available for archaeologists in order to promote and enrich research.

However, concern occurs related to medieval history of Crete and more specifically considering how it is represented and projected through material culture as well as how fieldworkers have any necessary access to this. The questions that come up are many; is it able for Cretan medieval pottery findings to be exhibited to one or two showcases of a museum? Is this enough? Were there any related excavations that could provide additional findings of that era? If so, where are those? Are they that similar to the ones already presented, explaining the main reason of concealment? Or is this earthenware just hidden somewhere? Underground maybe waiting for its discovery or in some storage room anticipating its study?

Inquiries as the above occur and seek answers. Through personal experiences which emerged during research for PhD thesis involving medieval pottery in Crete, light upon this matter will be shed, along with certain ideas for any modified models of medieval ceramics on display.

13 WORKING WITH MEDIEVAL AND POST-MEDIEVAL CERAMICS IN PORTUGAL. FROM EXCAVATION TO PUBLICATION

Author(s): Casimiro, Tania (IHC/IAP NOVA University of Lisbon)

Presentation Format: Oral

Ceramics are the most abundant type of material recovered in medieval and post medieval archaeological contexts in Portugal. Working with such objects is a high demanding task especially due to the amounts. An average urban excavation deals with thousands of sherds of objects produced either in Portugal or imported. Although archaeologists in Portugal are trained to deal with ceramics that training is not enough to deal with all the information we can retrieve from these artefacts. In this sense and in spite of archaeological reports have a general approach to ceramics this is not enough to actually conclude much about it. In this sense most of the research work surrounding ceramics is made by Master and PhD students. Is it easy to access collections, where and how are these stored, what techniques are usually used? These will be some of the questions.

This paper aims to discuss what kind of research is made in Portugal concerning medieval and post-medieval archaeological ceramics and all the process involved in ceramic research. What do archaeologists privilege when they approach ceramic collections and where is this research presented and published.

14 **STUDYING THE FURNACE WASTES OF MIRANDUOLO. ARCHAEOMETRIC ANALYSIS ON AN EARLY MEDIEVAL VILLAGE (CHIUSDINO- SI)**

Author(s): Menghini, Cristina (University of Pisa)

Presentation Format: Oral

Material culture is a part of the process to study any social context. In this direction, traditionally, ceramics represent an important marker to understand cultural, ideological and ritual phenomena of ancient societies. But, above all, the ceramic evidences are a reflection of all economic aspects related to ancient settlements. In fact, the study of pottery means to reflect on broader issues concerning processes of productions and provenance: are they produced on site or are they bought on a wider commercial network?

In the latest excavations, in the early medieval village of Miranduolo (eighth century), we found a lots of furnace waste, a clear evidence of pottery productions on site. These evidences allows to investigate on an unknown aspect of the settlement, concerning the production and the relationship between local and imported potteries. In this direction, archaeometric results are an essential contribution to this research; in addition to expanding the knowledge on the early medieval furnaces of Tuscany, archaeometric methodologies allow us to recognize the different phases of production, starting from the choice and the processing of raw materials up to the cooking systems. This methodology, applied on samples of furnace waste, is essential to understand the role and type of pots produced at Miranduolo. In other words, were they independent artisans or linked to the elite figures recognized in the community? Were they itinerant or local workers? Otherwise, could it only be a domestic production?

With this paper, I will try to answer these questions by looking the evidences for the purpose to define a socio-economic model for the eighth century village.

15 **“WHY THE CERAMICS” - A STUDY OF COCKSCOMB POT**

Author(s): Lu, Liu (China Central Academy of Fine Arts)

Presentation Format: Oral

Since Cockscomb pot was first excavated from Liao Dynasty (907-1125) Tombs in 1930s, it has accumulated considerable material data all around China. All along the dynasty,cockscomb pot had undergone a series of evolutions on the material, shapes and decorative patterns. Eventually the form of the ceramic was selected as the carrier, and developed continuously in the process of being ceramics. Around this question “Why the Ceramics”, this paper examines the relationship between concept and entity of cockscomb pot, summarizes the evolution process of the styling decoration, probes into the space position and the unit form in the burials. By analyzing the typical objects and the construction of the tombs of Khitan and Han, this paper discusses Khitan’s handicraft industry, the funeral customs, burial regulations and social ideology in the Liao Dynasty, as well as the interaction between the Khitan nomadic culture and Tang Song cultures in the context of ethnic interaction.

16 **GONE TO POT?**

Author(s): Hall, Derek (University of Stirling)

Presentation Format: Oral

This paper will consider the themes of this session from the perspective of a ceramic specialist based in Scotland who has been working in the field for 40 years. In recent years there have been a series of important funded research projects which have enabled the study of medieval pottery in Scotland to be much more meaningful. A big part of this has been the use of chemical sourcing (using ICPS). Further funding to continue such research is much harder to obtain, can this problem be solved? Most ceramics excavated at present are coming from developer funded rescue excavations, often there is little opportunity for anything more than a basic catalogue and spot date. Is this the best way of moving the subject on? Museums are beginning to run out of storage space, indeed some now refuse to take excavated material as a matter of course, is specialist on site advice as regards what material should be kept vital to limit what is finally retrieved and stored? Serious consideration needs to be given to the training of new pottery specialists, how can this be achieved? This presentation will attempt to offer solutions to some of these problems and consider the views of colleagues from across Europe.

A. **TRADITIONS OF MANUFACTURING POTTERY OF THE CORDED WARE CULTURE FROM SOUTH-EASTERN POLAND**

Author(s): Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow; Department of Anatomy, Jagiellonian University Medical College, Cracow) - Rauba-Bukowska, Anna (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow) - Jarosz, Paweł (Institute of Archaeology, Adam Mickiewicz University, Poznań) - Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow)

Presentation Format: Poster

The study include microscopic analysis of pottery of the Final Neolithic Corded Ware culture communities from south-eastern Poland. Vessels were found in richly equipped niche graves of individuals of different sex and age. Petrographic study of the pottery was focused on differences and similarities in clay preparing depending on kind of vessel and its decoration motives. The thin section of ceramic samples was analysed determining mineral composition and technology of pottery paste used in vessel production. The research encompassed the content of detrital material, grain size and rounding, and selection aspects. The two

main type of vessels e.g. amphora and beaker was subjected to analysis. The aim of these examinations was to set the rate of utilisation the local raw materials to the production of vessels. Conducted analyses also verified if similarly decorated vessels were locally manufactured or were traded in the interregional network.

The project is currently being implemented (National Science Centre, Poland, NCN 2015/19/B/HS3/02149).

B. ANALYZING LARGE COLLECTIONS OF NEOLITHIC POTTERY FROM THE SOZH RIVER BASIN (EASTERN BELARUS)

Author(s): Tkachova, Maryia (Institute of History NAS of Belarus)

Presentation Format: Poster

Active excavations of the Neolithic sites in the Sozh River basin were conducted by A. Kalechyts in the 1970s and 1980s. Following the tradition prevalent at that time, the researcher focused primarily on the accumulation of archeological sources, while the analysis and interpretation of the material were given less attention.

The study with these collections is complicated by several factors. Voluminosity – more than 20 thousands potsherds from five main sites – is among them. The further issues are that they came from non-stratified sites and were obtained with the old method.

Another problem the author faced is which category should act as a unit of counting – a potsherd or a vessel. Fragmentation of pottery complicates the reconstruction of complete shapes of vessels. The advantage of the material is that each vessel had its own specific features. There was no mass production of earthenware in the territory of Belarus during the Neolithic. With a close look at the collections, it was easy to identify potsherds belonging to a separate vessel. The analysis made it evident that it was the vessel, not the potsherd, should be the basic unit when analyzing such kind of collections.

Each vessel should be considered as a separate phenomenon with its own characteristic features. On the other hand, the Neolithic vessel is a complex system of features, for the documentation and further analysis of which computer methods should be used.

The statistical methods (correspondence analysis etc.) were employed for determination the hidden links between the variables included in the analysis.

The study resulted in distinguishing of the really existing types of pottery which reflect the cultural situation in the region. The revised periodization of the Neolithic of the Eastern Belarus was developed on the basis of the new typology.

C. ENHANCING SMALL MUSEUMS THROUGH DIGITAL APPROACHES: THE CASTELNOVO DEL FRIULI MULTIMEDIA EXHIBITION PROJECT

Author(s): Sarcinelli, Irene (University of Primorska) - Sartori, Elisa (University of Trieste)

Presentation Format: Poster

The project's idea springs from the small archaeological collection of Villa Sulis (Castelnovo del Friuli, Italy), in which only a selection of the over 5000 post-medieval pottery sherds found on site are displayed, and might stand as a good practice for other small historical, artistic or archaeological collections.

The project's main purpose is to restore to the community a piece of its otherwise not accessible cultural heritage and enhance its attractiveness to the public, using digital technologies.

3D models of a selection of unexposed ceramic finds, currently preserved in a closed depot, will be produced using photogrammetric techniques: models will become part of a virtual exhibition developed using the cross-platform game-engine Unity 3D that will be accessible through a specifically equipped area in the exposition hall. The visitor experience will also be integrated with an AR app which will provide him with extended captions, maps, 360° photos and educational videos. Both AR and VR experiences will be combined with traditional workshops targeted for children and adults.

To disseminate new knowledge and foster the young people's interest in the archeological collection, a series of video-lessons and storytelling sessions will be held via social network and dedicated website.

The project hopes to face the challenge to provide the visitor a satisfying experience in spite of relying on limited resources by using free-license software and staff skilled in the digital humanities field.

95 CPAA SESSION: ORGANISING ARCHAEOLOGISTS – ARCHAEOLOGICAL ASSOCIATIONS OF EUROPE

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Wait, Gerald (GWHeritage; EAA-CPAA) - Siegmund, Frank (DGUF) - Belford, Paul (CPAT; CIfA) - Scherzler, Diane (DGUF)

Format: Regular session

The EAA's Committee on Professional Associations in Archaeology held a very successful session in Barcelona and two threads from that discussion will be taken forward in Bern in 2018, in a session for which we invite papers. Professionalism of archaeologists and associations of archaeological professionals are two different concepts. The EAA maintains that all archaeologists should have access to membership in a professional association, but all archaeologists will belong to archaeological organisations that are not primarily 'professional' in nature or in activity. We must recognise that in this diversity there can be strength.

But to make use of the strength in that diversity we need to know:

- Who we are – we need to find the archaeological organisations of Europe, and
- What we all do, so that we do not unnecessarily compete amongst ourselves or confuse other parts of civil society by the way we speak and the messages we send out.

This session will contain papers addressing both strands of who we are and how we can and should clarify our roles and messages so as to more effectively influence civil society and governments at international, national and local levels.

ABSTRACTS

1 ORGANISING ARCHAEOLOGISTS – ARCHAEOLOGICAL ASSOCIATIONS OF EUROPE

Author(s): Wait, Gerald (GWHeritage) - Belford, Paul (Clwyd-Powys Archaeological Trust and Chartered Institute for Archaeologists) - Siegmund, Frank - Scherzler, Diane (Deutsche Gesellschaft für Ur- und Frühgeschichte)

Presentation Format: Oral

The EAA's Committee on Professional Associations in Archaeology held a very successful session in Barcelona and two threads from that discussion will be taken forward in Bern in 2018, in a session for which we invite papers. Professionalism of archaeologists and associations of archaeological professionals are two different concepts. The EAA maintains that all archaeologists should have access to membership in a professional association, but all archaeologists will belong to archaeological organisations that are not primarily 'professional' in nature or in activity. We must recognise that in this diversity there can be strength. But to make use of the strength in that diversity we need to know:

- a) Who we are – we need to find the archaeological organisations of Europe, and
- b) What we all do, so that we do not unnecessarily compete amongst ourselves or confuse other parts of civil society by the way we speak and the messages we send out.

By self-organisation we contend that archaeologists can exert better influence on governments and governmental agencies in order to improve and develop the value of heritage work to the public and improve the working conditions and careers of practitioners."

2 RECENT ROLES IN HERITAGE STRATEGIES, DEFINING AN ARCHAEOLOGIST, AND NAVIGATING A DYNAMIC PROFESSION

Author(s): Ryan, Chelsea (National University of Ireland, Galway; Institute of Archaeologists of Ireland)

Presentation Format: Oral

The Institute of Archaeologists of Ireland (IAI) is the representative all-island organisation for professional archaeologists working in Ireland and Northern Ireland. The primary objectives of the IAI include promoting contact, collaboration and cooperation between professional archaeologists and the organisations they belong to and improving archaeological standards throughout the island of Ireland.

Within the last three years, the IAI has achieved its core objectives by implementing a Three-Year Strategic Plan as approved by its members; signed a Memorandum of Understanding with the Chartered Institute for Archaeologists; maintained communication with Ireland's National Monument Service; partnered with Ireland's Heritage Council for a conference entitled, "Dig: the value of archaeology for society and the economy"; and taken an active role in the public consultation for "Heritage Ireland 2030", a new national heritage plan launched by Ireland's Minister for Culture, Heritage and the Gaeltacht.

Additionally, the 2019 IAI Annual Conference, "Now and Again: Current and Recurring Issues Facing Irish Archaeologists" primarily focused on the archaeological profession by way of two sessions. In Session 1, national stakeholders and IAI members presented their perspectives on the current state of the profession and future challenges. These papers were used as starting points for Session 2: round table discussions focused on issues facing the profession, such as the grading of archaeological practitioners, training of archaeological professionals, and "The Definition of an Archaeologist". Dr Sophie Hueglin, Vice President of the European Association of Archaeologists, acted as the conference's keynote speaker.

This presentation will outline the success and challenges of the IAI in maintaining its organisation objectives, discuss the outcomes of the IAI annual conference, and highlight new goals for the future.

3 PROFESSIONALS OF CULTURAL HERITAGE: RECENT UPDATE IN ITALIAN LAW SYSTEM AND FUTURE PERSPECTIVES FOR ARCHAEOLOGISTS

Author(s): Taloni, Maria - Venditti, Caterina Paola (Ministry of Cultural Heritage and Activities)

Presentation Format: Oral

The reorganization of the Ministry of Cultural Heritage created the General Direction for Education and Research.

The law decree gives to it, along with other competences, the redaction and the updating of national lists of qualified professionals expected by Code of Cultural Heritage and Landscape (art. 9bis). The law article was introduced by our first law (L. 110/2014) regarding professionals of cultural heritage: archaeologists, archivists, librarians, demo-ethno-anthropologists, anthropologists, restorers, diagnosticians, art historians.

The connected law decree is going to be approved, according with the Ministry of Education, University and Research and in respect with the Directive 2013/55/UE. However the national lists that will be published are not professional registers and signing up is not compulsory for working. Such a change leads a complex situation without precedents in the Italian law where ordinaristic professions, regulated and not regulated professions coexist. The role of professional associations, as for the law approval, is fundamental.

The Ministry is booting the preliminary phase for creating the national lists that regards also the IT management, developing an high level software architecture. The aim is to organize an hub for Ministry, companies and professionals with an advanced searching tool for each professional category and specific queries that give differentiate information depending on the associated metadata. It will be much more than a repository for lists thanks to its interoperable section infrastructure with multiple access points and multilayers architecture.

Professionals will have a reserved area for customizing their profiles with contact details, scientific interest topics, chosen working areas and cv.

In addition, the users' submitted data will connected to shape a national scale professionals "map", possibly managed by a GIS.

Indeed the ongoing system could be an interesting example in Europe to tackle common problems for qualified professionals of cultural heritage, among which archaeologists are a considerable part.

4 **ARCHÄOLOGIE SCHWEIZ. SWITZERLAND'S NATIONAL ASSOCIATION FOR ARCHAEOLOGY BETWEEN TRADITIONS AND FUTURE CHALLENGES**

Author(s): Thiermann, Ellen - Reitmaier, Thomas (Archäologie Schweiz)

Presentation Format: Oral

In this paper, the authors aim to present Archäologie Schweiz – Archéologie Suisse – Archeologia Svizzera to an international audience in order to discuss common goals and challenges and to foster collaboration with other European associations. Founded in 1907 as a learned «Swiss Society of Prehistory» promoting and sustaining archaeological research and conservation, Archäologie Schweiz is still the only national archaeological association in Switzerland covering all epochs and functioning also as an umbrella organisation with approximately 2000 members in all Swiss language areas.

Bringing together laypersons interested in archaeology and the grand majority of professional archaeologists, this historically grown unity is a rare feature in Europe bearing challenges regarding the variety of interests of its members, but also constituting its strength in terms of public engagement. The paper will address the peculiarities of Switzerland's archaeological heritage and its organisation of archaeological research and conservation as basic parameters. Archäologie Schweiz' continuing work in the field of publications, events, networking and political work will be presented, followed by a discussion of its current challenges and visions for the future. As topics like the digital turn in documentation, open access-publications, professional standards, community building and political lobbying are on the agenda of most archaeological associations, we would like to encourage the exchange of experiences and ideas with other session participants.

5 **THE SWISS ASSOCIATION OF CLASSICAL ARCHAEOLOGISTS**

Author(s): Kraese, Jeannette (University of Bern)

Presentation Format: Oral

The Swiss Association of Classical Archaeologists (SACA) was founded in 1992 and is composed both of professional archaeologists working in the field of Mediterranean archaeology in Switzerland and abroad, as well as of university students. One of the organisation's purposes is to represent the interests of the archaeology of past cultures in the Mediterranean region to the authorities and the wider public. As such, the SACA was consulted during the drafting of the Swiss Federal Act on the International Transfer of Cultural Property (LTBC) which was passed in 2005.

Furthermore, the SACA strives to promote networking among scholars working in the field of Mediterranean archaeology. Once a year a roundtable on a specific topic is organised to which researchers are invited to present and discuss the results of their studies. The SACA also maintains close ties to professionals from other archaeological and historical sub-disciplines through its memberships in the associations of the National Information Centre on Cultural Heritage (NIKE) and the Swiss Archaeology Network (NAS).

Finally, the organisation also acts as an information platform through it's website (www.saka-asac.ch) and yearly journal (Bulletin SAKA-ASAC) and has (co-)published scientific publications.

The aim of this paper is to present the history and the current status of the organisation to the international scientific community and to discuss some of its future goals.

6 **ARCHAEOLOGICAL PROFESSIONALISM AND ARCHAEOLOGICAL ASSOCIATIONS**

Author(s): Belford, Paul (Clwyd-Powys Archaeological Trust)

Presentation Format: Oral

The abstract for this session rightly notes that the professionalism of archaeologists and associations of archaeological professionals are two different things. This paper examines the relationship between the two with specific reference to the UK. The development of the 'polluter pays' model in the UK saw the emergence of a large 'private-sector archaeology' which ultimately

developed the Chartered Institute for Archaeologists (CIfA) as a means of self-regulation. However this process created a distinction between 'professional' and 'non-professional' archaeologists, and to some extent tension and confusion too. Ironically CIfA's early 1980s origins lay in an initiative by the Council for British Archaeology (CBA), which had itself been established to provide a forum and focus for a range of largely non-professional archaeological associations. Whilst some of these associations were national (or even international) in scope with a wide membership base of professional, academic and amateur archaeologists, many were much more regional or even local in focus and dominated by non-professionals. This paper looks at the ways in which the myriad of archaeological associations relate both to each other and to the professional association. Some ways in which fruitful partnerships could be delivered in the future are explored.

97 MOTHERHOOD IN (PRE-)HISTORY FROM A COMBINED BIO-ARCHAEOLOGICAL AND SOCIAL PERSPECTIVE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Rebay-Salisbury, Katharina (Austrian Academ of Sciences) - Stefanović, Sofija (Biosense Institute, University of Novi Sad/Faculty of Philosophy, University of Belgrade)

Format: Regular session

In recent years, an 'archaeology of motherhood' has started to emerge, which investigates one of the most profound changes of identity women experience: the transition to motherhood. Motherhood includes a range of cultural choices and practices in addition to the biological framework of sexual reproduction, which are subject to change.

For prehistoric Europe, little is known at what age women became mothers, how many children they had, how siblings were spaced and how families were composed. It is equally unclear if women were selected for reproduction, how the social status of women changed as they became mothers, and which rites and rituals were involved that might leave traces in the archaeological record. Objects related to pregnancy, birth and early childrearing are only slowly being identified, as interest in researching motherhood intensifies.

How motherhood was conceptualized and embedded in societies, however, has profound consequences on demography, population structure and even DNA composition. This session invites papers that advance our understanding of motherhood from theoretical, osteological, bio-archaeological, demographic, isotopic and genetic perspectives. The aim is to discuss motherhood in the light of the latest results emerging from aDNA and isotope studies across Europe and to firmly establish motherhood as a research topic in archaeology.

ABSTRACTS

1 CAN WE DETECT PREHISTORIC PREGNANCIES? POTENTIAL OF THE TOOTH CEMENTUM ANALYSIS FOR THE RECONSTRUCTION OF FERTILITY

Author(s): Penezic, Kristina (University of Novi Sad, Biosense Institute) - Petrović, Bojan (University of Novi Sad, Faculty of Medicine; University of Novi Sad, Biosense Institute) - Porčić, Marko (University of Belgrade, Faculty of Philosophy, Department of Archaeology; University of Novi Sad, Biosense Institute) - Ristović, Filip (University of Belgrade, Faculty of Philosophy, Department of Archaeology) - Stefanović, Sofija (University of Novi Sad, Biosense Institute; University of Belgrade, Faculty of Philosophy, Department of Archaeology)

Presentation Format: Oral

The importance of fertility in paleodemography cannot be overemphasized as it is the major determinant of preindustrial population dynamics and the crucial concept in anthropological and archaeological theory of demographic transitions. The possibility that a permanent record of the number pregnancies and age of mother at which the pregnancies occurred is preserved at the microscopic level in the tooth cementum may be of fundamental importance for further studies of fertility and motherhood. Certain life-events have been shown to interfere with the deposition of tooth cementum, among which pregnancy was mentioned. This important fact was however only referred to in a limited number of publications. In order to gain more specific knowledge of these occurrences we conducted a small-scale clinical study focusing on the detection of pregnancies recorded in the tooth cementum. Results obtained from this study are used for further interpretation of TCA (Tooth cementum annulation) analysis applied on a sample of teeth from archaeological contexts. All samples derived from archaeological sites are from individuals dating either to the Mesolithic or Neolithic period in the Central Balkan area. The aim of this study is to evaluate results from the clinical study and compare it to the results obtained from the archaeological sample. In this manner, we hope to tackle the complex question of pregnancies, fertility rates, and paleodemography at the advent of the Neolithic period.

2 HUMAN OSSICLES, A POSSIBLE BIOMARKER FOR THE DIET AND PHYSIOLOGY OF THE MOTHER DURING PREGNANCY

Author(s): Leskovar, Tamara (Department of Archaeology, Faculty of Arts, University of Ljubljana) - Beaumont, Julia (School of Archaeological and Forensic Sciences, University of Bradford) - Lisić, Nidia (Museum of London Archaeology) - McGalliard, Suzanne (MOLA Headland Infrastructure)

Presentation Format: Oral

$\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of collagen from teeth and bone are used to study human nutrition and health. As bones are constantly remodelling throughout life, isotopic values of bone collagen represent an average of several years. In contrast, human teeth do not remodel, and their primary dentine contains only the isotopic data from the time of formation. Novel techniques using micro-sampling of dentine have allowed better temporal resolution and the examination of tissue formed in utero as a proxy for maternal diet and physiology.

Contrary to all other bones, human auditory ossicles also do not remodel. As they develop in utero and finish formation in the first two years of life, their collagen should represent isotopic values of these two relatively short periods. By comparing $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ data from ossicles and incremental dentine, we investigated how two developmental periods of the ossicles, in-utero and first two years of life, reflect in collagen obtained from the ossicles.

Ossicle and tooth samples of 12 individuals aged 0.5 ± 0.4 years to 13 ± 1 years from the 19th century St. Peter's burial ground in Blackburn were collected and subjected to the isotopic analyses of carbon and nitrogen. The results showed a significant and systematic offset between ossicles and dentine formed at the approximately same time. Based on the comparisons with the incremental dentine and offset pattern, it seems that the second phase of the ossicle development does not influence the isotopic values of collagen significantly. It thus suggests that the data from the ossicles reflect the in-utero period and could serve as a biomarker for the diet and physiology of the mother during the first two trimesters of pregnancy.

3 BONE SPOONS FOR PREHISTORIC BABIES: DETECTION OF PRIMARY TEETH MARKS ON THE NEOLITHIC ARTEFACTS

Author(s): Stefanovic, Sofija (Biosense Institute, University of Novi Sad; Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade) - Petrovic, Bojan (Medical Faculty, University of Novi Sad; Biosense Institute, University of Novi Sad) - Porcic, Marko (Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade; Biosense Institute, University of Novi Sad) - Pendic, Jugoslav - Penezic, Kristina (Biosense Institute, University of Novi Sad)

Presentation Format: Oral

Around 8000 years ago, throughout the Neolithic world a new type of artefact appeared, small spoons masterly made from cattle bone, usually interpreted as tools, due to their intensive traces of use. Contrary to those interpretations, the small dimensions of spoons and presence of intensive traces of use led us to the assumption that they were used for feeding babies. In order to test this assumption, we compared 2230 marks on spoons from the Neolithic site of Grad-Starčevo in Serbia (5800–5450 cal BC) with 3151 primary teeth marks produced experimentally on fresh cattle bone. This study has shown that marks on spoons were made by primary teeth, which proves their usage in feeding babies. Our interpretation of the bone spoons' function, jointly with their wide distribution, could suggest that new kinds of gruel were also an important part of the 'Neolithic package'. The novelties in baby-feeding practices, indicated by spoons, could have had an important effect on the evolution of human fertility through shortening the length of the breastfeeding period.

4 MOTHERHOOD AND MARGINALITY IN BRONZE AND IRON AGE CENTRAL EUROPE AND ITALY

Author(s): Rebay-Salisbury, Katharina - Pany-Kucera, Doris - Perego, Elisa (OREA, Austrian Academy of Sciences)

Presentation Format: Oral

In this paper, we explore the intersection between motherhood as a biological and social process, and social categorisation, including practices leading to marginalisation and social exclusion.

The first part presents our approach of contextualizing possible skeletal markers of pregnancy and parturition with health status, degenerative changes and traces of occupational stress. Examples from Bronze and Iron Age central Europe and Italy illustrate a discussion of potential bio-archaeological markers of marginality (e.g. malnutrition, trauma).

The second part concerns the interpretation of bio-archaeological evidence of motherhood and marginality in their social context. In particular, we explore how women who were marginalised in their societies might have experienced pregnancy, childbirth and motherhood. We address how women with physical impairments and disabilities might be identified among those who became mothers or remained childless.

We will also address the relationship between physical impairment and abuse, asking whether and to what extent physical impairment triggered violence against women, and whether we can identify abuse as the cause of disabilities.

Research on motherhood emerges from the ERC-Starting Grant project 'The value of mothers to society' (KRS, DPK), while the MSCA project CoPOWER (EP) focuses on marginality and social exclusion in late prehistoric Europe.

5 THE GREEK COLONIAL EXPANSION (8TH-4TH C. BC) THROUGH PALAEODEMOGRAPHIC PROJECTIONS AND THE ROLE OF MOTHERS IN POPULATION GROWTH

Author(s): Zisis, Anastasios - Zafeiris, Konstantinos - Koukli, Marianna - Xanthopoulou, Panagiota - Georgiadou, Angelina - Papageorgopoulou, Christina (Laboratory of Physical Anthropology, Democritus University of Thrace)

Presentation Format: Oral

The scope of this presentation is twofold: on the one hand we bring forward a palaeodemographic approach of the phenomenon of Greek colonization (8th-4th centuries BC) based on computer simulation models. We model the mode and tempo of colonial movements and the evolution of colonial settings through a population structure and population growth aspect. On the other hand, we perform an anthropological and archaeometric case study on selected female individuals on a reproductive age from the necropolis of Abdera, a Greek colony located in North Aegean (Archaic & Classical periods).

Regarding the palaeodemographic part, we recreate the interactions between Greeks and locals on a 'global' Mediterranean level. Furthermore, we test the hypothesis of an overall population growth, which is considered reaching its peak in the fourth century BC. We use anthropological and archaeological data from Greek colonial sites (cities and necropoleis) for creating computer-based simulation models that could demographically fit the initial expeditions of the first settlers and the subsequent developments in population size and structure. For the anthropological and archaeometric part, we analyze the diet and nutrition of 50 female individuals from Abdera through their isotopic signatures of carbon, nitrogen and sulphur, and correlate them with estimations of their stature and BMI. Characteristics and variations in body height and body mass of females are integrated in the study as proxies for palaeodemographic modelling in order to assess diet in relation to growth and development. Demographic indices, such as the fertility rate of a population, are crucial parameters of well-being and potential population growth, as they are strongly connected with female health and nutrition. The auxological perspective in the study of Abdera explores the living standards of females coupled with demographic indexes, while focusing on mothers and motherhood.

A. UNDERSTANDING NEWBORN BABY MORTUARY PRACTICES THROUGH THE ANALYSIS OF NEONATAL LINE

Author(s): Penezic, Kristina (University of Novi Sad, Biosense Institute) - Stefanović, Sofija (University of Novi Sad, Biosense Institute; University of Belgrade, Faculty of Philosophy, Department of Archaeology)

Presentation Format: Poster

The neonatal line is a particular band of incremental growth lines that forms within the tooth enamel in both primary and permanent teeth. It becomes visible shortly after birth and it could be seen in the histological sections. In forensic science it is used as a sign of live birth. Clinical studies have shown that the width of the neonatal line could indicate the possible difficulties of childbirth. Namely, the wider the neonatal line is, more stressful and longer the birthing process was. We applied this technique to a sample of milk teeth of newborn babies excavated at Mesolithic and Neolithic sites in the Danube Gorges. At the sites of Lepenski Vir and Vlasac there are over 20 recorded newborn burials. For a better understanding of mortuary practices in Prehistory, it is of utmost importance to know whether these were live born or stillborn babies. This data could provide elements for further interpretation of the relationship towards birthing and dying, as well as birthing difficulties and document premature live births.

B. TRACKING CHILDHOOD AND MOTHERHOOD IDENTITIES IN ROMAN THESSALONIKI

Author(s): Ganiatsou, Elissavet - Papageorgopoulou, Christina (Laboratory of Physical Anthropology, Democritus University of Thrace)

Presentation Format: Poster

Breastfeeding and weaning are important biological processes, with great impact on the evolution and mental development of humans and primates. The duration of breastfeeding affects the cognitive and emotional development of infants as well as the growth of a population, through fertility, morbidity and mortality rates. Breastfeeding procedures are highly affected by cultural, religious and socio-economic factors while also determine the way social identities and norms are shaped. Moreover infant feeding patterns can inform us on childhood social identities and parental investment. Studies on breastfeeding and weaning patterns in the past, are mostly based on the application of incremental dentine analysis. This analysis is able to reconstruct infant feeding practices by tracking the isotopic shifts of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) of human tissues.

Our project studies breastfeeding and weaning patterns in Roman Thessaloniki (40 BC-400 AD) on a set of skeletal remains deriving from the eastern and western cemetery of the city. We apply the novel technique of incremental dentine analysis on permanent first molars in order to track the duration of breast milk consumption as well as the onset/offset of weaning. Through this, we seek to improve our understanding of the biological implications of these patterns for mothers and children such as the nutritional and health status and the reproductive strategies through these ages. On the bottom line, we focus on unfolding the cultural sides of breastfeeding and weaning practices, which shape a woman's role as part of a family as well as an active member of society.

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: de Waal, Maaike (Faculty of Archaeology, Leiden University; ARGEOgraph) - de Groot, Mara (Centre for Global Heritage and Development) - Rosetti, Ilaria (Department of Heritage, University of Antwerp) - Jinadasa, Uditha (Department of Archaeology, Ministry of Higher Education and Cultural Affairs, Sri Lanka)

Format: Regular session

With the majority of people living in cities and numbers of urban dwellers increasing daily, national and international policies are being directed towards stimulating livable and sustainable futures for cities. Many metropolises have a historic origin and developments through time have influenced development of the cities. Inner cities follow ancient waterways and roads; buildings and other structures may be (partially) historic. Modern city dwellers live in an environment that largely depends on decisions made by previous generations. Modern city life, however, constantly asks for adaptations and internal dynamics change city appearances and functions. Especially in the case of World Heritage cities adaptations are significant. Tourists, eager to experience the 'Outstanding Universal Value' of a place, require accommodation, food, entertainment and souvenirs. Developers convert historical buildings into hotels and tourist shops. Traffic constantly pressurizes old, narrow streets. Inhabitants increasingly move to less gentrified outer zones. Slowly, city characters change. While cores and buffer zones were once enlisted as World Heritage because of both the authenticity and integrity of a cities' parts, now these are exactly the elements that are under threat (with the ultimate risk of 'delisting'). The desire to assign a World Heritage status to living cities may overshadow the awareness of possible implications for the city and its inhabitants. It also raises questions whether studying the diversity of long-term urban traditions effectively inform design for sustainable urban futures, whether it is possible to find a balance between an authentic and a dynamic city life and who the stakeholders are and how are they involved in new developments.

This session crosses disciplinary and geographical boundaries in order to generate synergizing discussions on meaning and implications of 'World Heritage Listing', 'Living Heritage', 'Outstanding Universal Values', 'Integrity', 'Place Making', 'Sustainable Planning' and 'Authenticity'.

ABSTRACTS

1 LESSONS FROM LEIDEN

Author(s): Brandenburg, Chrystal (Erfgoed Leiden en Omstreken)

Presentation Format: Oral

The city of Leiden in The Netherlands is highly populated, densely built and ambitious in terms of economic growth and development. It is also a city with a distinct historic identity, more than 3000 monumental buildings and a city-outlay with canals and streets which originates in the middle ages.

One of the challenges many historic cities face is sustaining its historic identity and in the meantime allowing it to be used by its occupants and to be modernised. This means that buildings and the archaeological heritage are being protected where possible, but sometimes have to make room for new developments. This paper focusses on the way the city deals with the cases where we have to sacrifice part of our history. How do we choose what to protect and what not? How do we turn our loss into a gain by ensuring what is lost is documented? How do we combine different types of science to enrich our knowledge of the past? And lastly, how do we return this knowledge to the city and use it as an opportunity to improve the living conditions and wellbeing of its inhabitants?

2 ITALY'S POST-INDUSTRIAL PERIPHERIES: A CASE OF NEGLECTED WORLD HERITAGE

Author(s): Tonnetti, Alex (The New School of Social Research, NSSR, and Parsons. Independent Research.)

Presentation Format: Oral

Questions: 1. how to recover urban zones whose value has been overshadowed by the concentration of the cultural heritage load on specific zones assimilated as emblematic, or iconic, or symbolic, or representative of a city. 2. how to address the diversity and complexity of different heritage zones in a city, to recover a sense of continuity between zones which evolved in distinct historical times 3. how to find a balance between different historical heritages which are potentially meaningful for the World Heritage.

Examples: In Italian cities, the world heritage concentrates on Renaissance times, neglecting post-industrial sites, which still represent a value in term of historical landmarks and collective memory. These latter often witness abandonment and dismissal, when side tracked from more attractive areas for tourism and foreign investments. We explore the possibility of a re-evaluation of industrial sites and prisons that were redesigned according to new urban functions, drawing comparisons between Florence, Milan and other cities' peripheries.

In a larger scope of analysis, the Mediterranean Cities' value for the World Heritage often boils down to the Ancient, Medieval, and Early Modern periods, leaving other historical parts in the darkness. In terms of the character, these peripheral areas often present a sense of shame for tarnishing the bright iconicity of inner city. This however brings risks such as a) creating imbalance

of the urban development and growth, b) misperception of the collective memory of the city as a place, with the inner city turned into the sole repository of the urban authenticity and of the official collective memory of the city, d) indiscriminate modernization of the peripheries, and breaking a sense of continuity between the different parts of the whole organic fabric of the city.”

3 VISUALIZING THE INVISIBLE. A MODERN INDUSTRIAL CITY WITH A LIVING ARCHAEOLOGICAL HERITAGE

Author(s): Jansen, Richard (Faculty of Archaeology Leiden University)

Presentation Format: Oral

At first sight the city of Oss (southern-Netherlands) appears to be a small and ordinary, modern city where history seems to be erased. Little of the medieval origin of the city and its unique 19th and 20th century industrial history has been preserved. Especially in the 1960s and 1970s, much was demolished in the context of large spatial developments.

At the same time, the extensive rebuilding and expansion of the city has triggered a large-scale archaeological research project. Since the 1970s, hundreds of hectares have been investigated, dozens of which have been excavated.

Over the last 15 years the municipality put a lot of effort in the utilisation of the knowledge from all that research. In this lecture I want to illustrate how ‘invisible’ archaeological heritage and their accompanying narratives can not only be visualized but also engaged for a livable and sustainable environment. Visualizing the invisible archaeological heritage also created awareness for contemporary dwellers that they live in an environment that once was occupied by previous generations.

Finally the archaeological heritage contributes to the city-branding. The city of Oss has been struggling for decades with a negative image. Making her deep history part of the identity of 21st century city not only makes inhabitants ‘proud’ of their city, it also contributes to a more positive city image.

4 INTERSTITIAL WASTELANDS AS ANTIDOTE TO URBAN MONOCULTURE?

Author(s): Stadhouders, Karin (Leiden University, Centre for Global Heritage and Development)

Presentation Format: Oral

Heritage as a concept is intrinsically dynamic, determined by values and valuations that change over time. Furthermore, most landscapes and places we value as cultural heritage result from a history of continuous change and adaptation. Paradoxically, we are inclined to rigorously preserve and proudly exhibit our acknowledged relics as unalterable entities.

Thus movement and stasis compete in heritage landscapes, specifically in compact urban landscapes. These are at risk to develop into monocultural areas, where the only remaining dynamics waver between preserving heritage and top-down efforts to sanitise rubble-space, between facilitating tourism and controlling its negative effects. Such one-sided views on heritage management and planning eventually hamper innovation, cultural diversity, liveability, and from a heritage perspective: the creation of ‘new’ urban heritage.

Fruitful new dynamics will need ‘free space’: space for experiments, creativity and spontaneous engagement. Free physical space may be scarce in compact cities, but the main obstacles for free space are rather found in immaterialities: impatience, and the will to keep control.

We may learn from the recent history of the rehabilitation of post-industrial wastelands. Since the 1970s an increasing number of wastelands from the industrial era, often situated in urban areas, have been rediscovered, revalued, and found new functions. Many of these previously neglected places are now popular, even officially qualified as cultural heritage. The growing body of research on this topic shows diverging experiences and opinions, critical perspectives, and ambiguities. Many findings, though, point to the positive impact of spontaneous, unplanned (temporary) uses of left-over places, abandoned buildings, empty plots. An over-arching aspect seems the refrainment from structured planning, either out of necessity or as deliberate policy choice.

In my paper I explore this aspect, evaluating if and how interstitial urban wastelands function as free spaces fostering engagement and creativity, as well as creating ‘new’ urban heritage.

5 DANCING WITH THE PAST

Author(s): Neupert, Mark (Oregon Institute of Technology)

Presentation Format: Oral

Dancing with the Past is a documentary film that investigates the relationship between people and place in the old city center of Leiden, the Netherlands. Walkable, livable cities have caught the imagination of citizens and urban planners everywhere. Cities, such as Leiden, that were founded on “pre-modern” urban forms provide a living laboratory to observe how design decisions made hundreds of years ago created excellent habitats for human beings; the very qualities that now present a new set of challenges.

Dancing with the Past shows how archaeologists, historians, urban planners and government officials can collaborate to weave together past and present with an eye to the future. In recent years, the City of Leiden has undertaken a series of initiatives that blend old and new, including the creation of new “medieval-scaled” alleyways, transit-oriented development, re-purposing abandoned factories for affordable housing, traffic engineering, and historic preservation, all with the intent to strengthen the historic city patterns. These professionals are learning from the past while making a sustainable and livable city of the future.

6 BRIDGETOWN, BARBADOS: A LIVING WORLD HERITAGE CITY IN THE WEST INDIES

Author(s): de Waal, Maaïke (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

In 2011, Historic Bridgetown and its Garrison, was recognized as a UNESCO World Heritage Site. The historic centre of the Barbados' capital city, together with its nearby military garrison, is a unique example of British colonial architecture. The historic city is characterized by a distinctive 17th-century serpentine street lay-out and includes a large number of historic monuments dating from the 17th, 18th and 19th centuries.

At the same time, Bridgetown is a vibrant city and home to no less than 110,000 people. In addition, Barbados welcomes another 38460 tourist visitors each month on average, most of whom also visit Bridgetown to enjoy the city life and to benefit from the many tax free purchase opportunities. Adding this to the fact that the city is also the government and business centre of the island, it makes one curious to find out how well the dynamics of a vibrant city life go together with a seemingly more static heritage situation in this particular example. In addition, Barbados is a small island developing state (SIDS), which has implications for the possibilities for management and protection of the island's cultural heritage.

This paper will focus on how different stakeholders are using and experiencing Bridgetown's World Heritage Site, and some challenges and success stories relating to heritage preservation will be highlighted.

7 AN ASIAN EXPERIENCE OF GENTRIFICATION IN WORLD HERITAGE CITIES: OLD TOWN OF GALLE AND ITS FORTIFICATIONS, SRI LANKA

Author(s): Jinadasa, Uditha (Leiden University)

Presentation Format: Oral

The Old Town of Galle and its Fortifications gained heritage recognition in 1988 due to its Dutch colonial architecture (under the criterion iv). Since inscription, it has experienced increasing gentrification as a result of a booming tourism industry combined with stringent local heritage policies, which prioritize the preservation of Dutch colonial architectural heritage over the local community. This paper surveys the gentrification levels of the city with qualitative and quantitative analysis methods. It also analyzes the reasons behind these processes, focusing on local and international heritage policies. It argues that the exponential increase in land value of the fort, a direct result of heritage recognition, has turned the ordinary colonial town house into a commodity that caters to tourists in various ways. Today, the majority of town houses are either owned or leased by local and foreign investment companies and businessmen, causing a population drop by one third. While one fifth of private properties are currently owned or leased by foreign investors, by contrast, residential buildings in the city have dropped by half. Conflicting interests persist between the heritage authorities and the community over developing properties. While the conservation goals of the heritage authorities in preserving colonial built heritage is partially fulfilled, the whole process has displaced the local residents.

8 ANCIENT TARRACO, MODERN TARRAGONA: AN OUTSIDER'S PERSPECTIVE OF A WORLD HERITAGE SITE AND ITS PROBLEMS

Author(s): Forrester, Colin (Universitat Rovira i Virgili; IPHES)

Presentation Format: Oral

This paper concerns the oldest roman settlement on the Iberian Peninsula which became the Roman city of Tarraco. Established during the second Punic war, Tarraco was the capital of the Roman province of Hispania Citerior and later of Hispania Tarraconensis but is known nowadays by the name Tarragona, which is the capital of the southern region of Catalunya, Tarragona in Spain. In 2000 Tarraco was made a World Heritage site by UNESCO.

Like a lot of modern cities that have developed around an older city, a large amount of the Roman archaeology has been utilised to build later buildings and walls. While there has been a lot of damage due to various regional disputes which saw Tarragona coming repeatedly worse off to its northern sister city of Barcelona, there is a tremendous amount of impressive Roman archaeology still accessible of which the city is rightly proud of.

But Tarragona is a living vibrant city, and it is not only its Roman heritage that needs to be preserved but its rich medieval, Napoleonic, and republican heritage that also needs to be celebrated and acknowledged.

This paper takes an outsider's view of this wonderful city and examines the problems the Country, Region and City have in preserving and developing all aspects of this precious heritage for future generations to come. It will look at not only the funding aspects but the logistics, the legal requirements and the social inclusion of keeping this city a hidden jewel on the Mediterranean coast.

9 ADAPTATION OF CIRCULAR MODELS FOR GLOBAL HERITAGE CITIES: REGENERATION OF ISTANBUL WORLD HERITAGE SITE AS A CASE STUDY

Author(s): İkiz Kaya, Deniz (Eindhoven University of Technology; Ozyegin University)

Presentation Format: Oral

In this rapidly globalising world, managing change in historic cities while promoting their sustainable development has been a daunting task. It is further complicated for global heritage cities, defining historic urban landscapes (HUL) designated as World

Heritage Sites within global cities, by a number of issues: engagement with global actors in addition to a broad range of stakeholders; increasing complexity of legislative, administrative and operational systems; and the imperative to engage local communities meaningfully in sustainable development and management processes. Acknowledged as leverage for more inclusive, safe and resilient cities, cultural heritage and HUL conservation play a crucial role here as drivers of sustainable development. UNESCO's HUL Recommendation has presented interdisciplinary tools to cope with these challenges, and new management models have been developed to further operationalise these principles.

The circular economy model has been proposed to understand the complex relationships between wide range of values and stakeholders, to valorise these resources in synergistic means, and to illustrate the symbiosis between conservation and development. This approach however requires new evaluation and management tools to be developed and tested. In this research, hence, a regeneration project implemented in the Istanbul WHS will be examined as a case study to provide empirical evidence of the economic, social and cultural benefits of this synergy within globalised urban context. Initially, cultural, natural and human resources of the site, and its impact on the values will be investigated. Then, social network analysis and cognitive mapping techniques will be employed to map out the complexity of decision making, followed by the analysis of their unique management tools and strategies. This assessment will complement the examination of existing operative tools and will test some of the key indicators introduced by the circular economy model through the employment of an innovative mixed methodology and a novel case study.

10 100 YEARS OF REMOTE SENSING AND URBAN SPRAWL: MULTI-TEMPORAL, MULTI-SENSOR MAPPING OF A HISTORIC CITY

Author(s): Kristiansen, Søren (Department of Geoscience, Aarhus University; Centre for Urban Network Evolution - UrbNet, Aarhus University) - Stott, David (Department of Geoscience, Aarhus University, Denmark; Moesgaard Museum, Højbjerg) - Lichtenberger, Achim (Westfälische Wilhelms Universität Münster, Institut für Klassische Archäologie und Christliche Archäologie) - Rubina, Raja (Centre for Urban Network Evolution - UrbNet, Aarhus University)

Presentation Format: Oral

Archaeological remains embody vital information about how humans have adapted to macro-scale economic and environmental change in the past, and can inform how we in the present can adapt to these changes. However, these very processes of change directly threaten these remains. To mitigate the impact of implacable economical development on the historic environment we need to urgently map and characterize as much of it as possible. Doing this is only feasible using remote sensing methods to cover large areas. However, making sense of the fragmentary remains in the present can be challenging, as often much has been lost already, and interpreting fragments without their wider context is difficult. This can, however, be addressed by tapping the vast archives of remote sensing imagery available, including aerial photography, Cold War surveillance imagery and satellite data. These enable us to both contextualize what remains and to quantify what has been lost.

Here we will explore the application of state of the art remote sensing techniques for the mapping of cultural heritage threatened by urban encroachment during the last century. We demonstrate this using the ancient city of Jerash, Jordan, as a case study, using aerial photography dating back to 1917 in conjunction with modern airborne laser scanning. The archaeological site is representative for modern cities as the 20th and 21st centuries rapid demographic expansion and population movement caused by geopolitical instability in the region has led to much of the ancient city and its environs being obliterated by modern development.

This paper present the recent work of Stott et al. (doi.org/10.1073/pnas.1721509115) and serves to highlight these issues and argues that, by adopting these approaches and making the resulting mappings available to researchers and decision makers as open data, a more sustainable future for such irreplaceable cultural heritage information can be assured.

11 ISSUES ASSESSING THE IMPACT BUILDING MAJOR INFRASTRUCTURE FACILITIES IN RUSSIA HAS ON THE NATION'S ARCHAEOLOGICAL HERITAGE

Author(s): Zelentsova, Olga - Engovatova, Asya - Bogachuk, Daria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Constructing major Russian infrastructure projects has expanded over the last 10-15 years. Projects include major highways (particularly east-west), construction of gas and oil pipelines, and numerous hydroelectric power stations.

It's certain that archaeological heritage also suffers during works on this scale. Contemporary Russia follows guidelines for new road schemes, bypassing major population centres. Builders choose routes with minimum cadastral costs, through land which is poor for either farming or capital building projects. These watershed lands have low numbers of archaeological heritage sites. Road-building now impacts archaeological sites far less than two decades ago. Road-building policy keeps costs low, and helps to preserve archaeological sites. One example is the Moscow-Kazan Highway, where the IA RAN has been involved for the past three years.

Russian archaeological sites are imperilled when near to hydroelectric installations – risking flooding of ancient long-inhabited areas.

In recent years, the IA RAS surveyed before construction of hydro-electric installations in the middle reaches of European Russia's largest river, the Volga – at the Cheboksary Hydroelectric Station.

The affected area was studied by our Institute, including collaboration with local museums and universities. Locations and boundaries of archaeological sites were determined, and a list of preservation measures been set up. As a result of the survey, 121 archaeological sites emerged as at risk of damage. The overall area of archaeological sites which require rescue archaeological excavation totals 432,486 square metres. Our hope is that the Cheboksary facility will not go ahead - and that the threatened sites will be saved.

Collections made as the result of excavations further expand material in Russia's local museums.

12 **MANAGING CHANGE. HERITAGE IMPACT ASSESSMENT, A TOOL FOR SUSTAINABLE DEVELOPMENT**

Author(s): de Groot, Mara (Centre for Global Heritage and Development)

Presentation Format: Oral

Companies with their business operations have a major impact on the environment, our surroundings, economy and society as a whole. Many impact assessments have already been developed to map this impact.

Environmental Impact Assessment (EIA) is common practice in most parts of the developed world, this is not the case for Heritage Impact Assessment (HIA) though. Why not? Do we value our cultural environment less than our natural physical environment? Or is it because the tool is more recent and still unknown? Dutch policymakers are negative towards including HIA as part of the set of prescribed assessments because they are afraid it would hamper development.

Culture is an important part of sustainable development because it touches on a number of important goals such as inclusiveness, the right to cultural heritage and the quality of the living environment. In my paper I will demonstrate that HIA is by no means a conservation tool. I will reflect how HIA fits in a sustainable business management and I will argue that HIA should become part of the compliance of those companies that have an actual impact on our environment.

13 **LIVING WORLD HERITAGE CITIES – A CRITICAL REFLECTION ON STAKEHOLDERS’ PARTICIPATION IN HERITAGE MANAGEMENT**

Author(s): Rosetti, Ilaria (University of Antwerp)

Presentation Format: Oral

Cities are living organisms which undergo a perpetual change according to peoples' uses and needs. When cultural heritage is embedded in the urban fabric, it experiences tensions between preservation and development, due to the coexistence of multiple values and interests of different stakeholders. In World Heritage Cities, this tension is amplified by the complexity that Outstanding Universal Values (OUVs) bring and by the increasing number of stakeholders who claim connection to cultural assets. As 'social inclusivity' is internationally seen as a key element for the sustainable development of historic cities, the participation of various stakeholders in decision-making for urban transformation is high on professionals' agenda.

Recently, scholars have investigated stakeholders' participation in specific urban development projects, providing valuable insights on local practices worldwide. Despite contextual differences between cases, it is highly relevant to compare their practices in order to draft a broader overview on participation trends. Henceforth, this research aims to investigate these trends, by reviewing literature on participation, looking at stakeholders who are involved in urban development of historic cities in different cases and their role during the management process. Furthermore, current participatory practices carried out within the Organization of World Heritage Cities' network will be investigated through a survey, unveiling local governments' representatives' perception of these practices.

This paper focuses on the role that stakeholders have in heritage management in WH cities, looking at behavioral differences and similarities on a global and regional level. It also reflects on the implications that specific roles can have in defining stakeholders' responsibilities in the heritage field, and therefore, on the importance that clear definitions of stakeholders' categories has. Results can inform policies and planning on an international and local level, by giving a global overview of stakeholders' participation and setting the basis for further research on a regional and local level.

109 **GETTING INTO SHAPE: RECONSIDERING THE RELATIONSHIPS BETWEEN PERCEPTION, SKILL, COGNITION AND MATERIALS IN THE DESIGN OF ANCIENT FIGURINES**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Murphy, Celine (Heritage Management Organization Athens) - Aston, Alexander (University of Oxford)

Format: Regular session

In looking back on the archaeology of the last two centuries, it is presently noticeable that research on ancient figurines was heavily influenced by the aesthetic trends prevailing at the time of its undertaking. This dynamic is clearly illustrated by, for example, past fluctuating descriptions of Cycladic figurines as 'primitive small monsters' or as great works of minimalist art (see commentary in Gill and Chippindale 1993). Moreover, alongside such phenomena arose discussions that the appearance of ancient figurines resulted directly from their makers' artistic skill, and that artistic skill developed chronologically (see commentary in Zeimbeki 2004).

In the light of recent archaeological theoretical and methodological developments, the aforementioned approaches are now debatable. In this session, we therefore explore new avenues for understanding what other factors may have influenced the appearance of ancient figurines. In deconstructing the concept of 'artistic skill' and 'style' (see Cochrane and Meirion-Jones

2018) we consider afresh the idea of 'design' behind appearance. We also seek to more closely investigate the role of materials in artefact production, alongside the general impact of human cognitive and perceptual development upon design processes.

We address the following questions:

- What impacts do materials used in figurine production have upon the development of skilled behaviour?
- How are perceptual relationships influenced and facilitated by specific materials and styles?
- In what ways do production of, and engagement with, representations of bodies and faces impact cognitive processes?
- Is it truly possible to assess developments in figurine appearance chronologically and stylistically?
- Do concepts such as typology, sub-varieties, and a focus upon identifying specific "artists", still provide useful frameworks?
- What would new methodologies or alternative aesthetics for interpreting the development of figurine appearance consist of?

We accept papers concerning any form of ancient figurine. We impose no geographical or chronological limitations."

ABSTRACTS

1 AN INTRODUCTION: UNFRAMING ANCIENT FIGURINES

Author(s): Aston, Alexander (University of Oxford) - Murphy, Céline (The Heritage Management Organization, Athens)

Presentation Format: Oral

Figurines occupy a unique space within the archaeological record as some of the oldest artefactual images created by humans. It is presently noticeable, however, that their analysis has been complicated by two main factors: on the one hand, changing theoretical perspectives on the relationships between mind, matter and technology, and, on the other, the application of methodologies employed for the examination of artefacts such as ancient tools or domestic wares to their study. Such approaches have frequently resulted in attempts at 'explaining' figurines and in the assumption that, given their lack of clear practical and functional uses compared to other artefact types, figurines only have symbolic potential.

Interested in shifting this framework, we here explore and discuss the implications of applying aesthetic and ergonomically-rooted values employed in the study of artefacts, such as tools or domestic wares, to ancient figurines. In doing so, we first argue that figurines are a category of artefacts in its own right of which the technical and aesthetic aspects cannot be compared with those of other types of artefacts. Second, and consequently, we suggest that perspectives on design, style and skill need to be redefined in the context of figurine studies. Third, we therefore argue that the use of experimental programs in research on figurines is therefore advisable. Discussions on design, style and skill can be significantly deepened by physical examinations of the artefacts and engagement with the materials.

Experimental studies on materials and perception, evidence from neuroscience, non-representational approaches to semiotics, and Anti-Cartesian models of cognition all open up space to critique and redefine our understanding of the design, meanings and functional uses of figurines. They subvert traditional assumptions and allow for the development of novel explanations."

2 TRACING BODY CONCEPTS IN EGYPTIAN PRE- AND EARLY DYNASTIC ANTHROPOMORPHIC SCULPTURE

Author(s): Speck, Sonja (Mainz University)

Presentation Format: Oral

Usually, studies on anthropomorphic figurines focus on two research questions: "What is their function?" and "Whom or what are they representing?" As no distinct practical use can be assigned to them, they are generally interpreted as belonging to religious, funerary or domestic cults. Problematic archaeological contexts in which figurines occur constitute a considerable obstacle to answering these questions, which is often further complicated by the absence of information from textual sources.

Nevertheless, anthropomorphic figurines contain even more information that is frequently overlooked: the knowledge and ideas about the human body. Anthropomorphic figurines are artefacts of human thought like all forms of artistic expression. Based on that, anthropomorphic figurines can be understood as direct self-expressions of humans about their self-perception, self-concept and their image of their community.

Conceptualization and manufacture of anthropomorphic figurines are based on cognitive processes – these processes can be fathomed and understood to a certain extent even today as they are universal for all humans. Us as modern researchers cannot find out WHAT the original producers, observers and users of the figurines were thinking, but with the help of approaches from cognitive science, we can trace HOW they were thinking.

Hence, this paper, which is based on my PhD-project within the research training group "Early Concepts of Humans and Nature: universal, specific, interchanged" (DFG-GRK 1876), proposes a methodology which combines traditional approaches from archaeology and image studies with results from cognitive science to recover the underlying ideas about the human body. By the means of a case study from Egyptian Pre- and Early Dynastic anthropomorphic sculpture (approx. mid/late 5. millennium B.C. – 2700 B.C.) the benefits of this approach will be demonstrated.

3 HOW THE CYCLADIC ISLANDERS FOUND THEIR MARBLES: MATERIAL, SKILL AND SOCIAL COGNITION IN THE ANCIENT AEGEAN

Author(s): Aston, Alexander (University of Oxford)

Presentation Format: Oral

Cycladic sculpture is perhaps the best known and most esteemed category of prehistoric figurines. Yet, this esteem has deeply restricted understanding of these artefacts due to looting and the illicit trade in antiquities and the emphasis on the figurines as works of art. Roughly thirty percent of known Cycladic figurines come from secure contexts. This lack of evidence has led to rampant speculation on the symbolic meanings of the figurines (e.g. the mother goddess) as well as overstating design similarities as evidence of crafting by specific individuals. These often unfounded and exaggerated claims stem from an assumption that our contemporary typologies are valid and form conceptual blind spots regarding the relationship between mind, matter, and environment. This presentation argues that through a multiscalar and interdisciplinary approach, one can reconceptualise the design and function of Cycladic figurines as a process of cognitive-developmental niche construction that reshaped the boundaries of social cognition in the EBA. Utilising Material Engagement Theory, this paper explores the relationship between the properties of marble, the development of skill, and the broad ecological and settlement patterns in which Cycladic styles emerged. By applying the evidence from neuroscience and cognitive science on body and face perception, the presentation demonstrates how Cycladic figurines were an effective technology for capturing joint and collective attention. It then explores the non-representational semiotics that are manifested by Cycladic figurines and their contexts in order to show how the figurines supported shared understanding and activity. By applying this evidence to the long-term transformations in Cycladic marble sculpting from the Neolithic to the EBII sanctuary on the island of Keros, it illuminates the design and use of the figurines as a kinshipping technology. In other words, shaping and circulating marble provided an embodied, enactive and distributed semiotic ecology through which social cognition self-organised at emergent scales.

4 WAYS OF LEARNING, WAYS OF SHARING: CLAY RELIEFS AND SCULPTURES IN THE SIERRA MIXE OF OAXACA, MEXICO

Author(s): Zubieta Calvert, Leslie (Universitat de Barcelona; University of Western Australia; The University of the Witwatersrand)

Presentation Format: Oral

Malleable clay deposited naturally into the depths of a newly discovered cave in 2011 was the raw material used to create more than 50 clay reliefs and sculptures resting on natural terraces of the same material. Unlike figurines, these are not three-dimensional objects that can be lifted and transported. The majority of these figures portray human beings, mainly female, with distinctive facial features. Based on the preliminary results of collaborative fieldwork in 2018 with the Ayuujk people of Oaxaca, the knowledge and skill required to give shape to clay in a subterranean landscape will be explored. In this paper, I discuss the importance of the aesthetic quality of the final result but will also emphasise the creation/creative process and design behind this extremely rare material culture found along a subterranean river. The display and arrangement of a vast repertoire of clay figures and succinct rock art might be showcasing a memorising technique that Mesoamerican cultures used to narrate and pass on culture.

5 FABRICATING EGYPT: FAIENCE FIGURINES IN GREEK CONTEXTS

Author(s): Skuse, Matthew (University of St Andrews)

Presentation Format: Oral

In the Archaic Period, Egyptianising objects including figurines were mass-produced on Rhodes and at Naukratis in a non-clay ceramic which we typically call Egyptian faience.

Recently, progress has been made in understanding the composition of 'Greek' faience and the locations and techniques of its manufacture. However, the matter of how the properties of this material and the processes of its production shaped its conceptual and perceptual qualities in the Greek world has been overlooked.

In firing from a brown or pale paste to a hard, glossy, turquoise finish, faience was a unique substance, paralleled only by precious stones but used by a broad range of social classes. Egyptological studies have highlighted how faience's raw materials, malleability, and self-glazing properties held special significance, including in faience figurines' association with concepts of 'being and becoming' in religious and magical practices.

It is only natural, therefore, that we should now consider how this alchemical process was perceived in the Greek world. In this paper, I will discuss the relationship between faience's raw materials, its production, and its uses in Greek contexts by addressing a range of questions: Was faience conceptually different to clay? Why were Egyptianising figurines not made in clay? Were the production processes of faience figurines as important as their Egyptianising forms or motifs for their significance and function? Were the conceptual properties of faience manufacture transmitted alongside the technology itself? If so, how could these concepts map onto the broader interaction of material properties and religious/magical practices in the Greek world?

6 PIGMENTS AND PIGMENT-CONTAINING MATERIALS IN SIBERIAN UPPER PALEOLITHIC TIME (IDENTIFICATION, RESULTS, DISCUSSION)

Author(s): Liudmila, Lbova (Novosibirsk State University)

Presentation Format: Oral

Cultural assemblages associated with the evidence of the use of various pigments in Siberia appeared around 50–40 ka BP. Initial Upper Paleolithic Siberian sites such as Kara-Bom, Denisova Cave, Malaya Syya, Khotyk-3, and Kamenka demonstrate variations in forms, colors, and ways of pigment use. Multi-element composition of pigment materials was obtained through SEM-EDX analysis, and showed differences in the use of various natural ingredients. Composite pigments and a wider color spectrum, including red, blue and green colors, replace the use of natural pigments (goethite, hematite, limonite, malachite, azurite and colorful clays) and mixed, artificial formulations of the Upper Paleolithic Siberian collections.

Microscopic examination and identification of traces reveal the presence of ornamental decoration and complex pigments composition on the surface of items of personal ornament and sculptures in Siberian Classic Upper Paleolithic sites, such as Khotyk-2, Ust'-Cova, Mal'ta, Buret' and Yana-site, for example. Of particular interest is the plot coloring (red, black, green, blue) of anthropomorphic and zoomorphic figurines which we found in the collections of Ust'-Kova, Shestakovo, Mal'ta and Buret' (19-23 ka BP).

The use of natural pigments in culture has two aspects: daily utilitarian and symbolic. Household use of pigments, especially ochre, is known from ethnographic materials as antiseptic, adhesive material, skin softener and as a mineral addition for food.

We are very grateful to the Russian Foundation for Basic Research for funding this study (project No. 17-56-16016).

7 TIME AS DESIGNER: CONSIDERING THE LONG-TERM MATERIAL CHANGES OF ANCIENT FIGURINES

Author(s): Murphy, Céline (Heritage Management Organisation)

Presentation Format: Oral

It is infrequent that time, slowly passing over the long term, be considered as an important element in research on ancient figurines. Rather, on the few occasions that time is discussed, it is usually in relation to short term events, occurring primarily during the figurines' production. In addressing this imbalance, I therefore here explore the implications that slow passing time may have had on the consumption of figurines, and especially, how this impacts our understandings of the notion of figurine 'design'.

Until the advent of the twenty-first century, numerous archaeological studies on ancient figurines built on the assumption that design was a process which occurred prior to the objects' material creation. More recently, however, design has begun to be conceptualised as a less materially-detached, less temporary phenomenon, which continues developing throughout the manufacture of an object, in accordance with how materials respond to the hand. Building on this premise, I here propose that design can therefore also continue occurring throughout a figurine's consumption, and even beyond this, after the figurine and user have 'parted ways'.

As is the case during an object's production, materials continuously change during its consumption. A figurine becomes worn, breaks, is repaired or is left to decay. Aware of such potential changes, figurine producers sometimes rendered their creations easily breakable for specific uses or, on the contrary, very solid so that they may last longer. Similarly, surfaces were treated with incisions to ensure durability, while in other cases light washes, intended to be short-lived are applied. The physical changes that figurines underwent during their consumption and after their final deposition – and therefore over time – can consequently also be considered as part of the design process. Time modifies, and in doing so, continuously designs and redesigns.

8 HOLLOW AND DIFFERENT: NEW INSIGHTS ON LATE BRONZE AGE TERRACOTTA FIGURES AND FIGURINES FROM BOEOTIA

Author(s): Phialon, Laetitia (University of Fribourg; UMR 7041 ArScAn Univ. Paris 1 - Paris Ouest)

Presentation Format: Oral

In Mycenaean Greece, most terracotta figurines were small and modeled (c. 1400-1100 BC), but large wheel-made or clay-coil examples, which have been termed figures or statuettes, were hollow (c. 1300-1150 BC). If the function of the female figurines and figures have long been at the center of the debate – the first being usually regarded as offerings and the second as cult statuettes or a part of a cult equipment (e.g. at Mycenae and Tiryns) –, the production technique outside the Argolid did not attract a great attention.

This paper aims to explore the links between production techniques, shapes and visual effects of hollow terracotta figures and figurines in the Late Bronze Age. A special attention will be paid to the painted decoration, in order to better assess their chronological development, as it has been already proposed for Mycenaean figurines (anthropomorphic and zoomorphic). This research will mainly focus on figures and figurines from Boeotia, including two figures from Thebes and a figurine from Tanagra. This last piece is of particular interest, since it seems to display morphological and technical characteristics of Minoan figurines, but close examination reveals that its lower part is not hollow.

It is worth recalling that, in Crete, from the beginning of the Late Minoan period (c. 1600 BC), some terracotta figurines were modeled and solid, but most female figurines had a hollow cylindrical inferior part. It is generally accepted that this inferior part was wheel-made, possibly wheel-thrown or wheel-fashioned. However, a handmade shaping was also a plausible option. This raises the question of how hollow zoomorphic figurines and figures were produced in the Aegean Bronze Age. It comprises hollow animal

figures seen as zoomorphic vessels, likely used as cult paraphernalia, which were part of a long tradition in the Bronze Age both on the Greek mainland, Boeotia included, and on the Aegean islands.

9 PERCEPTION AND REPRESENTATION OF THE HUMAN BODY. CLAY FIGURINES IN THE ANCIENT NEAR EAST DURING THE 3RD MILLENNIUM BC)

Author(s): Peyronel, Luca (University of Milan)

Presentation Format: Oral

The paper deals with the appearance of anthropomorphic images in the Early Bronze Age coroplastic (c. 3000-2000 BC) and discusses its meaning in ancient Syria and Mesopotamia from a diachronic perspective. Is the presence of regional figurine types the result of cultural and ideological differences? How does the development of specific manufacturing techniques influence this popular handicraft production? A detailed characterization of the figurines, achieved through archaeometric analysis and morpho-typological features will be used for the identification of regional groups and local workshops, in order to investigate how the manufacturing process interacts with cultural preferences for specific anthropomorphic imagery. The debated question of the identification of male and female figures as humans or supra-natural beings will be also analyzed, taking into account the apotropaic and magic rituals of breaking and burning clay figurines. The various anthropomorphic categories will be finally compared with the artistic production of composite figurines in precious materials dated to the same period. Focusing on the Early Dynastic/Early Syrian period, the materials from ancient Ebla in Northern Syria will be presented together with textual data from the Eblaic cuneiform archives (c. 2400-2300 BC) in order to investigate the relation between the high artistic production of composite statuettes/standards and 'popular' terracotta figurines.

10 THE WRONG TOOL FOR THE JOB? CLASSICAL ARCHAEOLOGY METHODS IN THE STUDY OF PREHISTORY: THE CASE OF THE CYCLADIC FIGURINES

Author(s): Chrysovitsanou, Vasiliki (University of West Attica)

Presentation Format: Oral

The, mostly, marble figurines are the most iconic feature of the Cycladic civilization. The white marble, the simplified form and the strange appearance of the statuettes have attracted the interest of European tourists, geographers, geologists and collectors of curiosities from the late 18th century. In the two-and-a-half centuries, during which Cycladic figurines have drawn the attention of experts, and indeed of non-experts, the approaches that have been adopted are many and varied. Until the end of the 19th century, most researchers, with the notable exception of Tsountas, have examined the Cycladic figurines from the perspective of the great works of art of classical antiquity and depreciated them. This began to change in the 20th century, when modern sculptors, in search of new ways of expression, found in the Cycladic figurines, as well as in the works of sculpture of other "primitive" civilizations, elements that would revitalize their art. Their fast rising popularity, mainly from the 1960s onwards, led many scholars to study them outside their archaeological context. The Cycladic figurines were now studied without reference to their archaeological identity, as works of art, products of great artists/masters of prehistory, while, through typology, artists, workshops and island schools have been identified. This new approach is carried out by using the methodology and tools of classical archaeology. The question examined in this paper is whether the method used in classical archaeology, for example, the typological examination by Beazley of the pottery of the classical era, can be applied to works produced by the prehistoric craftsmen of the Cyclades. The applicability of such an approach becomes even more doubtful given the fact that the actual use of these figurines has not been established, that for most of them we lack a clear archaeological context and that so-called "shapeless" and "naturalistic" figurines coexist.

11 DOCILE MAIDS IN THE MARSHES: NEW KINGDOM EGYPTIAN COSMETIC SPOONS IN THE FORM OF SWIMMING GIRLS

Author(s): Matic, Uros (Westfälische Wilhelms-Universität Münster)

Presentation Format: Oral

This paper will deal with figural representations of swimming girls on the so-called cosmetic spoons from New Kingdom Egypt (c. 1550-1070 BC). These elaborately designed objects were made mostly in ivory and were probably used for perfumed ointments. Their basic form is a loosely dressed or nude swimming girl holding a recipient more often than not in the form of a duck or a gazelle. The handles of the so-called caryatid bronze mirrors of New Kingdom Egypt are also in the form of loosely dressed young girls. Figural representations of the swimming girls of cosmetic spoons and the standing girls of mirror handles have the iconography of a nubile girl in common. Like the swimming girls, mirror handle girls sometimes hold small animals in their hands. Parallel representations on New Kingdom Egyptian paintings help us to identify these girls as nfr.wt "beauties", understood as unmarried girls or social virgins. The paper compares the iconography of the swimming girls of cosmetic spoons and the standing girls of mirror handles. It also discusses if the function of the objects and the tactile nature of their use could indicate that the girls in question are maids. Like it was previously suggested for mirror handles (Quack 2003), to hold such an object in the hand is to have a docile maid in the grasp of the hand. This is emphasized by the fact that the swimming girls are depicted in moments of leisure, namely swimming and catching ducks. Grasping these figural representations of maids would have meant not only having control of their bodies but their activities and free-time.

111 DEVELOPMENT OF HERITAGE MANAGEMENT EDUCATION

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Willems, Annemarie (AW Heritage Consultancy; Helsinki University) - Aitchison, Kenneth (Landward Research Ltd)

Format: Round table

The concept of archaeological heritage management (AHM) has been key to wider archaeological research and preservation agendas for some decades. Many universities and other education providers now offer what is best termed heritage management education (HME) in various forms. In 2017 an innovative working-conference 'Development and Best Practices of (Archaeological) Heritage Management as a Course' was organized and attended in Tampere, Finland by the organizers of this session. We initiated a debate on what the components of Archaeological Heritage Management (AHM) as a course or curriculum should include. The Tampere working-conference was a starting point for a robust discussion about how university teaching and training can contribute to the shaping of a new all-round heritage professional that can operate effectively in different contexts.

In this round table we would like to follow-up on these discussions by focusing on one of the main outcomes that 'there is a need for a curriculum in AHM that is better aligned with practice'.

114 ILLEGAL OBTAINING AND TRADE OF ARCHAEOLOGICAL ARTEFACTS: STATUS QUO AND COUNTERACTION

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Mödlinger, Marianne (University of Genoa) - Caspari, Gino (University of Bern) - Črešnar, Matija (University of Ljubljana) - Kairiss, Andris (Latvian Academy of Culture)

Format: Regular session

In the framework of the session we will discuss illicit circulation of archaeological objects. The problem is going to be observed in particular through the perspective of fluid networks, i.e. interchangeable participants (such as looters, smugglers, antiquity dealers, experts, auction houses, collectors, museums), which are connected through single interactions. They often perform highly specific roles at each network node and simultaneously dilute responsibility.

We will discuss functions and tasks of these network participants, including but not limited to looting, smuggling, trading, document falsification, provenance generation, antiquity marketing, and object verification.

A special focus will be the understanding of how monetary value is created and increased. Consequently, we encourage discussions on illegal business strategies at different nodes of fluid networks, on assessing risk awareness and risk behaviour of market participants, and on the effectiveness of counteraction policies.

Particular attention will be paid to the political and juridical side of illegal obtaining and trade of archaeological artefacts, and different strategies discussed.

We would like to identify knowledge gaps and future avenues of research in order to find new possibilities to reduce the damage being inflicted upon our shared cultural heritage and discuss how to increase awareness not only of market participants but local communities about the devastating effects on cultural heritage and economic growth caused by looting and trading of archaeological objects.

ABSTRACTS

1 THREATS TO ARCHAEOLOGICAL HERITAGE AND SOCIO-ECONOMIC CONSEQUENCES: LATVIAN CASE STUDY

Author(s): Kairiss, Andris (Latvian Academy of Culture)

Presentation Format: Oral

Threats to cultural heritage, incl. looting and destruction of archaeological sites, illegal obtaining, removal, and trafficking of antiquities lead to impoverishment of archaeological heritage. These threats are often observed from the point of view of criminal justice and heritage deprivation, not always paying sufficient attention to socio-economic consequences.

The research literature on the threats to archaeological heritage and their consequences most often addresses situations in countries located outside the Baltic region of Europe. However, the statistical information on the damage of Latvian archaeological sites and the illegal trade of archaeological artifacts originating from Latvia leads to the conclusion that the danger for archaeological heritage in the country is significant, although the situation has improved in recent years. Therefore it would be useful to conduct a study regarding socio-economic consequences of the aforementioned threats.

These socio-economic consequences concern both local and regional development barriers from the point of view of cultural tourism, economic activities, investment, public revenue, scientific and research potential, museum performance, cultural and aesthetic losses, lack of possibilities to know one's own history, and also in terms of preserving cultural and historical heritage for future generations.

Considering the size of Latvia in terms of territory and population, disturbances of local and regional socio-economic development can also have a significant impact on national development.

The presentation, using available empirical data, will provide insight into socio-economic consequences of the threats to archaeological heritage in Latvia, as well as outline further research to be carried out in this area.

2 THE UK TREASURE ACT REVIEW: MONETARY VALUATION OF ARCHAEOLOGICAL ARTEFACTS

Author(s): Godfrey, Evelyne (Uffington Heritage Watch)

Presentation Format: Oral

The UK Government's Department for Digital, Culture, Media, and Sport (DCMS) held a public consultation in early 2019, aimed at widening the legal definition of "treasure" under the Treasure Act (1996). The law requires members of the public in England, including metal detectorists, to report finds more than 300 years old & made of at least 10wt% gold or silver. If two or more gold or silver coins are found together, they are classed as "treasure". Finds of single gold or silver coins don't require reporting. Ten or more copper alloy coins found together are classed as "treasure", as are finds of two or more base-metal objects dated to the Iron Age or earlier. Apart from these examples, objects made of other materials aren't compulsorily reported. "Preservation by record" is sometimes achieved by suggesting members of the public voluntarily contact a regional Finds Liaison Officer to identify and record the non-treasure object before it is returned to the finder. Artefacts not classed as treasure can be legally sold on the art market. "Treasure" artefacts are sent to a government-appointed committee that assesses the monetary value. The finder and the owner of the land where the find was made are offered this amount, if it can be raised by a museum. In around 70% of Treasure Act valuation cases in the last 20 years, no museum acquired the objects, leaving finders free to sell the antiquities. The DCMS public announcement on Twitter of the current consultation read: "Do you enjoy looking for, preserving, or admiring buried treasure? We want to hear from YOU...". This paper will review proposed changes to the Treasure code, and wider concepts of "preservation by record", private ownership, and financially-based 'value' and 'significance', that prevail in England, despite the UK's ratification of the Valletta Convention in 2001.

3 CIRCULATING ARTEFACTS: A CROSS-PLATFORM ALLIANCE AGAINST THE LOOTING OF PHARAONIC ANTIQUITIES

Author(s): Rindi, Carlo (Department of Ancient Egypt & Sudan, The British Museum)

Presentation Format: Oral

The archaeological legacy of ancient Egypt and Sudan is renowned for its outstanding preservation and is uniquely important for the study of early civilisation. It is valued by both the global and local communities, inspires national pride, and is a key economic resource through the tourist industry. However, increased levels of looting have caused great losses to archaeological sites, museums and magazines. There are now more illicit artefacts on the international art market than ever before since the 1970 UNESCO treaty on cultural property. The problem is multifaceted and should be tackled from multiple directions.

Any attempt to fight the looting and trafficking of pharaonic antiquities must involve a concerted effort by the Egyptological community to monitor the art market. Only greater vigilance by the experts will truly pressure dealers and collectors to meet higher standards of ethics and transparency, thereby enabling more detections and repatriations of illicit artefacts. This need is now being addressed in the Circulating Artefacts project, an initiative of the British Museum conducted in partnership with the antiquities authorities of Egypt and Sudan. Thanks to a grant from the Cultural Protection Fund, which is run by the British Council, we are equipped to develop an innovative online platform. This centres on a database of pharaonic antiquities seen in the trade and in private collections. A valuable tool for collaborative work, it exposes dealers and collectors to closer scrutiny by subject specialists and law enforcement agencies.

The online platform was launched in February 2019, enabling anyone to contribute new information to the database. This paper provides an overview of the project's objectives, its strategy, and its first results in counteracting the illicit antiquities trade through the efforts of the project and its partners.

4 A JOURNEY TO THE WEST - EXPORTING ILLICIT ANTIQUITIES FROM CHINA THROUGH HONG KONG

Author(s): Caspari, Gino (University of Sydney; University of Bern)

Presentation Format: Oral

Hong Kong has been a gateway for illegally acquired antiquities from Mainland China for a long time. A largely ungoverned situation makes it easy for local dealers to launder items and export them internationally. The topographical characteristics of the area make Hong Kong a place which is hard to control. The rugged coastline is difficult to guard and the administrative borders leave convenient loopholes for smugglers. The antiquities trade is facilitated by individuals and organizational entities specializing in the transport of illicit goods. However, other than with Mediterranean antiquities, there is very little risk awareness of market participants, offering a chance to learn more about the structure and functionality of the network. This talk will give a preliminary insight into how illegally excavated items from Mainland China find their way into Hong Kong and what methods are employed by different network nodes in order to distribute risk and maximize profit.

5 BRING OUT YOUR DEAD: THE TRIALS AND TRIBULATIONS OF USING COMPUTER VISION TO STUDY THE HUMAN REMAINS TRADE

Author(s): Huffer, Damien (Stockholm University) - Graham, Shawn (Carleton University)

Presentation Format: Oral

Computer vision applications are being rolled out into general society with little oversight and broad ethical concerns. We discuss what we see as some of the immediate ethical dimensions to the use of computer vision as a means to map cultural heritage/property trafficking networks and investigate cases, specifically within the confines of our 'Bone Trade' project (<https://bonetrade.github.io/>). This project seeks to understand and map the trade in licit and illicit human remains, a trade that sits within an ethical and legal gray zone as a wide variety of archaeological, historic, ethnographic and anatomical human remains are transformed from cultural or medical heritage into commodities. We address the ethical and moral dilemmas that can confound the use of neural network approaches to computer vision to classify and sort thousands of images, in this case 'scraped' from public, anonymized social media accounts and e-commerce platforms on which human remains are bought and sold. The categories used to 'train' the machine are self-determined by the researchers and so naturally replicate human bias ab initio. How do these neural network approaches break to create false positives or false negatives when attempting to classify photographs taken from social media sales records as either old authentic items or recent forgeries made using remains sourced from unknown locations? What potential do they have to be exploited by dealers or forgers as a way to 'authenticate the market'? We generate 'new' images of human remains based on what the neural networks 'learn' to get a sense of what attracts the attention of the neural network as a way to explore these issues.

6 RADIOCARBON DATING OF ANTIQUE OBJECTS AND THE PROTECTION OF CULTURAL HERITAGE

Author(s): Hajdas, Irka (ETH Zurich) - Jull, Timothy (University of Arizona, Geosciences; Institute for Nuclear Research, Hungarian Academy of Sciences, Debrecen; University of Arizona, AMS Laboratory)

Presentation Format: Oral

From the very first days of radiocarbon dating method in the early 1950's, the importance of this chronometer to studies of human history was recognized. The advent of the accelerator mass spectrometry AMS and a substantial downscaling of sample sizes from grams to milligrams of material opened the doors for dating precious objects of cultural heritage. The last decades have witnessed an increased interest in applications of the ^{14}C dating of art and cultural heritage objects. Among material studied typically are parchment, textiles, paper, and wood. Developments have been made in the analysis of less common materials such as iron, mortar, binding media and pigments.

Other technical developments lead to an increase in capacity of existing AMS laboratories. Moreover, new laboratories including so-called satellite laboratories have been established. This creates more opportunities for the antiquities markets for using ^{14}C analysis to validate antique objects. A unified approach to this problem is proposed by the radiocarbon community. However, future collaborations with museums and institutions of cultural heritage protection are needed to increase effectiveness and assure that ^{14}C is not used to drive illicit antiquity trade. This paper is a summary of the ongoing activities and a call for an interdisciplinary co-operation.

A. MUSEUM SALVAGE: RENEWED HOPE FOR UNPROVENIENCED ARTEFACTS

Author(s): Lien, Lauren (University College London)

Presentation Format: Poster

As archaeologists, looting is the bane of our existence. Unfortunately, it can also be a hobby and passion for those interested but generally uneducated in the realm of cultural heritage and the value of proper field recordation methods. What happens to looted objects may vary – often times they end up in a museum's possession, where they are considered "safe" from the illegal antiquities market, but due to their illicit origin they are then imprisoned to a life of sitting on a shelf in storage rather than contributing to our knowledge of the past. These unprovenienced artifacts are ostracized by professionals because they have been detached from much of their scientific value, and to study such haphazardly obtained artifacts may have the potential to encourage further looting attempts. This ultimately presents a risk for museum workers that house such objects, challenging how we may begin to approach and interact with these materials. This project addresses the controversial nature of ethics involved in studying noncontextualized artifacts in museum collections, using the ceramic collection at the Lancaster Museum of Art and History (MOAH) in Lancaster, California (USA) as a case study to address the possible benefits of looking further into these lost artefacts through the concept of museum salvage.

121 CURRENT RESEARCH AND THE DEVELOPMENT OF NATIONAL POST-MEDIEVAL ARCHAEOLOGIES OVER THE LAST 25 YEARS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Mytum, Harold (University of Liverpool; Society for Post-medieval Archaeology) - Campbell, Eve (Achill Archaeological Field School) - Nordin, Jonas (Swedish History Museum)

Format: Regular session

Post-medieval archaeology is unevenly developed across Europe, with differential recognition, access to resources, and leg-

islative support. Nevertheless, the trend is for greater recognition of historical archaeology with universities, museums, and government agencies increasing their commitment to the heritage of the recent past. Current socio-political shifts highlight the tensions between nationalism and regionalism, colonialism and post-colonialism, industrialisation and post-industrialisation, and reactions for and against globalisation. These are all tensions which post-medieval archaeologists study with a unique material time depth, and case studies will examine how individuals or communities operated within these larger parameters and the ways in which they contributed to or limited these trends through their actions. This session, sponsored by the Society for Post-Medieval Archaeology, will allow these issues to be discussed as national experiences within a European context, and will celebrate the continuing increased appreciation of the archaeology of the last half millennium. The papers will be relevant to the Berne theme of 'EAA 25' by examining how current projects sit within the historiography of the archaeology of recent times in the relevant countries and regions, whilst celebrating best practice within the presenters' contemporary heritage politics.

ABSTRACTS

- 1 THE ARCHAEOLOGY OF THE INVISIBLE: LANDLESS SUBALTERNES IN RURAL SWEDEN (C. 1700- 1850)**
Author(s): Nilsson, Pia (The Archaeologist, National Historical Museums) - Hansson, Martin (Department of Archaeology and Ancient History, Lund University) - Svensson, Eva (Environmental Science, Risk and Environmental Sciences Karlstad University)
Presentation Format: Oral

Hidden in the written sources, neglected by the contemporary land-surveyors and with none or vague traces left in the landscape, the subalterns heritage is to a considerable degree invisible to us. Archaeology is a useful tool to understand and reveal several aspects of their heritage. But, due to several reasons, the archaeological remains of the subalterns (crofters, lodgers, poor-house inmates etc.) are often explicitly considered of limited or no value in connection with contract archaeology and research. Hereby, the heritage and our knowledge about a tremendously large part of the population in the period c 1700 – 1850 vanishes rapidly.

When it comes to the archaeological heritage of the subalterns the excavation, if any is considered necessary, in general is restricted by factors such as low cost, limited resources, inexplicit questions and vague interpretations.

This is in obvious contrast to the prevalent view among the public, where the landless subalterns' heritage is highly appreciated and important because it concerns our history, identity, democracy, continuity and sense of belonging. The heritage of the subalterns, including inhabitants in rural as well as urban slums, is also relevant in order to be able to observe and to understand processes in the society, and in the world, today.

This paper will address, by examples from Swedish contract archaeology practice, some reasons why the antiquarian archaeological interest is limited, or at least staggering. We will also try to identify questions and goals for the archaeological work, as well as to suggest priorities and methods. Our aim is to contribute to an improved heritage practice, where the heritage of the invisible majority is found, interpreted and told.
- 2 ENCOUNTERING THE SUBALTERN: HISTORICAL ARCHAEOLOGY OF ETHNIC PROLETARIANISATION IN EARLY MODERN SWEDEN**
Author(s): Nordin, Jonas (Swedish National Historical Museums)
Presentation Format: Oral

Recent decades of developments within historical archaeology has spurred the interest in the past of Scandinavia's' indigenous population: The Sámi. The deep history and the geographically wide spread evidence of Sámi presence in the past has been of decisive importance for a wider understanding of a multicultural past. Implementation of experiences from North American historical archaeology has meant a growing critique of earlier emphasis on acculturation and homogeneity. Instead current research has showed a wide variety of Sámi life ways, practices and strategies, in central Sweden during the early modern period and a plethora of interactions with the majority society. This paper focus on the ethnic cleansing during the early eighteenth century and the creation of an indenture system specially dedicated to Sámi people that developed during the following centuries only to be dissolved during the twentieth century. Ongoing archaeological field work has been able to unfold evidence of resilient Sámi communities, existing side by side with the majority society both under severe constrain but also developing own identities. Through archaeology a hitherto almost untold history has addressed and scrutinized.
- 3 A POST-MEDIEVAL ARCHAEOLOGY IN GREECE? NOTES FROM THE MOUNTAINS**
Author(s): Moudopoulos Athanasiou, Faidon (University of Sheffield)
Presentation Format: Oral

Greek post-medieval heritage is known by an other name: Ottoman. For reasons related to Nation-State identity politics, the Ottoman era was never part of the core heritage discourse. The reasons for this exclusion have been thoroughly addressed in theoretical terms but in practice there are only a handful (but increasing) advances when it comes to field archaeology. In contrast to systematic efforts to place the Ottoman history and built heritage in the centre of the discourse (e.g. the international MA in Ottoman History at the University of Crete the group "Ottoman Heritage of Greece"), archaeology is adapting slowly to this

new trend.

The aim of this contribution is to offer an analysis of the reasons why our discipline is adapting last. The information provided emerge from my PhD fieldwork in the mountains of Zagori (NW Greece) and through theoretical investigations regarding the potential nature of an Ottoman archaeology in Greece. I will address the multidisciplinary nature of landscape archaeology and suggest that an Ottoman archaeology in Greece must grow anthropological reflexes, as it is summoned to interpret an era widely considered as the "national other". I will also argue that substantial knowledge of regional Ottoman history has to complement relevant endeavors, and provide an example of bad practice. Last, I will debate the positioning of archaeologists in relationship to local communities and "their" heritage, baptised by 19th and early 20th century folklorists in bipolar narratives regarding the "bad Turk".

I believe that a montane approach is important for methodological issues. Mountains in the national narrative evoke the values of primitivism and backwardism. Only when it comes to revolution (against the Ottomans) or resistance against foreign occupiers (WWII), they are glorified. Nevertheless, local histories and material culture tell different stories when it comes to the Ottoman past...

4 RESEARCHING THE POST-MEDIEVAL ARCHAEOLOGY OF THE DERWENT VALLEY MILLS WORLD HERITAGE SITE, UK

Author(s): Knight, David (York Archaeological Trust)

Presentation Format: Oral

The Derwent Valley mills and the associated infrastructure of workers' housing, schools, churches, canals, railways and other built remains, together with the surrounding landscape, were inscribed as a World Heritage Site by UNESCO in 2001 in recognition of the importance of the area for the development of the factory system. Much has been written about the Valley's textile mills, industrial housing and other built remains, but significantly less research has been conducted on the lead mining and smelting sites, charcoal-burning platforms, stone quarries and other post-medieval archaeological sites that lie concealed in woodlands along the valley sides or are buried beneath floodplain alluvium. A recently published Research Framework for the World Heritage Site has highlighted the rich industrial archaeological resource of the Derwent Valley and has identified key priorities for post-medieval research. We will consider how the granting of World Heritage Site status has impacted upon strategies for survey and investigation of the Valley's archaeological resource, how the Research Framework that was developed as a requirement for maintaining the Site's status with UNESCO has guided recent research, and the challenges posed by current social, economic and environmental pressures.

5 CONTEMPORARY PASTS AND FUTURE PASTS OF THE 20TH CENTURY URBAN SITES IN THE NORTHERN FINLAND

Author(s): Ylimaunu, Timo - Äikäs, Tiina - Hyttinen, Marika - Matila, Tuuli (University of Oulu) - Mullins, Paul (Indiana University-Purdue University Indianapolis)

Presentation Format: Oral

Post-medieval archaeology has become a one of the major sub-fields in the Finnish archaeological research. It has been mainly focused on early modern urbanization, especially in Northern Finnish towns, and how this urbanization was connected to global urbanization. The archaeology of the recent past has been examined as well, mainly sites and memories of 20th century conflicts, especially World War II. In our paper we will discuss the difficulties early modern archaeology and, especially, the archaeology of the recent past has faced in Finnish heritage policy. We will use the 20th century industrial and World War II sites in northern urban contexts to stress the importance of the archaeological research to preserve the data of the past, not only for contemporary research but for future archaeology. We are facing more and more problems studying the 20th century urban archaeological sites and preserving the material culture from these sites for the future.

6 POST-DISSOLUTION ARCHAEOLOGY AT BRITISH MONASTIC SITES: COMPARING ATTITUDES IN THE 1970S AND 1980S WITH THOSE OF TODAY

Author(s): Mytum, Harold (University of Liverpool)

Presentation Format: Oral

The ways in which the archaeology of medieval monastic sites have been approached is an excellent mirror of the wider attitudes to post-medieval archaeology in Britain. Early 20th-century excavators concentrated on exposing medieval ruins, and even removing later building elements, but by the later 20th century it was more often recognised that the later deposits were of value and should be recorded to some degree. Monastic sites often have complex site biographies that last as many centuries after their closure as religious sites at the Reformation as they did in their monastic state. Only relatively recently, however, has the archaeological potential of these biographies been recognised, with research explicitly directed at post-Dissolution phases both in terms of analysing standing remains and through excavations. Using the example of Norton Priory, the most extensively scientifically excavated site in Europe, this shift in emphasis is demonstrated by comparing the campaigns of the 1970s and early 1980s and the recently commenced long-term research programme where the post-Dissolution is a major period of interest. We can see a shift from ignoring the post-medieval, to partial recording and analysis of deposits and finds, to the generation of narratives that continue through the post-Dissolution phases. The final stage of articulating specific research aims that are

devoted to the post-medieval are now emerging.

- 7** **'SHODDY IMPORTED CULTURE OF THE TOWNS': DOMESTIC MATERIALITY AND SOCIAL CHANGE IN THE WEST OF IRELAND C.1700-1900**
Author(s): Campbell, Eve (Independent)
Presentation Format: Oral
- Developing in a post-colonial context, Irish archaeology's early years focused on the prehistoric and early medieval periods, fashioning an appropriate past for the new state. Serious interest in the archaeology of the post-medieval period was slow to develop, only gathering significant pace in the late 1990s. Prior to this, vernacular material culture was largely studied under the aegis of folklore. In part due to the largely aceramic character of medieval Gaelic Ireland, and their reputation as a 'foreign' or 'intrusive' aspect of material culture, commercially-produced ceramics have historically received little attention by researchers in this area. Ó Duilearga, for example, in his foreword to the Handbook of Irish Folklore (1942), lamented how the 'shoddy imported culture of the towns push back the frontiers of the indigenous homespun culture of the countryside'. More recent scholarship has acknowledged the centrality of mass-produced commodities in rural households, but much work remains to be done on domestic materiality during the eighteenth and nineteenth centuries. Archaeology offers a unique insight into quotidian practices, and consumption patterns during the recent past. Drawing on evidence from excavated, coupled with folklore and Gaelic vocabularies, this paper seeks to tease out shifting material practices among rural populations in the west of Ireland during this period. It examines the variety of domestic vessels used (wood, wicker, coarse earthenware, and refined earthenware) parsing their multiple meanings in the context of broader material and (gendered) social practices. Finally, it considers the impact of discourses such as improvement on these practices, and how they changed over time.
- 8** **EXCAVATING 'HELL UPON EARTH'. THE ARCHAEOLOGICAL INVESTIGATION OF WORKERS' HOUSING: CASE STUDIES FROM THE MANCHESTER CITY REGION, UK**
Author(s): Nevell, Michael (University of Salford)
Presentation Format: Oral
- This paper uses 18 years of targeted fieldwork on excavating workers' housing in the Manchester city region, UK, to assess a variety of research approaches to the investigation of urban industrial housing of the late 18th, 19th and early 20th centuries. Manchester was one of the 'shock' cities of industrial Britain, and a honey pot for social commentary during the Victorian period. Using data from more than 35 excavation sites, this paper looks at the way in which archaeological evidence can be used to explore issues around house build quality, overcrowding, sanitation and disease, and reconstructing households from their material remains. Manchester's reputation for poor living conditions during the industrialising period was crystallised around the comments of contemporary social commentators from Engels to Gaskell. Yet, the archaeological evidence reviewed here demonstrates the value of archaeological approaches in challenging and testing such views through detailed case studies. More importantly, it shows that archaeological material can be used to study directly features of the new industrialised form of urban living, providing a set of research questions applicable across the industrial urban workers' housing of Britain and beyond.
- A.** **THE KAUKANA PROJECT: UNDERWATER ARCHAEOLOGY ALONG THE SOUTHERN COAST OF SICILY**
Author(s): Innocenti, Dario - Capulli, Massimo (Università di Udine) - Tusa, Sebastiano (Soprintendenza del Mare Regione Sicilia)
Presentation Format: Poster
- Inhabited since prehistory, the southern part of Sicily in the area between the ancient settlement of Kaukana and Kamarina is packed with archaeological sites. The area, frequently a point of contention between the ancient populations, preserves in his waters many shipwrecks, and along the coast many sites that can be dated back from prehistory to modern times.
- The University of Udine, cooperating with the Sicilian Soprintendenza del Mare and with the support of Institute of Nautical Archaeology, from 2017 is leading the "Kaukana" project, which has the aim to survey the coastal landscape and analyse the already known shipwrecks to recognize new sites (both on land and underwater) with the purpose of understanding the dynamics of management and use of the coastal space in the past.
- This paper will present the first results that, thanks to a wide and deep coastal and underwater survey, allowed to better document some already known shipwrecks and to locate new shipwrecks, to identify ancient moorings and, thanks to a productive historical research, reconstruct the methods of interaction between the coast and the main land.
- B.** **ARCHAEOLOGICAL PATH IN INTERDISCIPLINARY RESEARCH OF THE POLISH-SLOVAK BORDERLAND CARRIED OUT IN 2018**
Author(s): Majorek, Magdalena - Ginter, Artur (Institute of Archaeology, University of Lodz)
Presentation Format: Poster
- Project under the name of Muszyna - Plaveč: We discover a forgotten history and culture of the Polish-Slovak borderland, assumed an archaeological prospection of the hillfort adjacent to the Muszyna Castle, study the embankment surrounding the city, carry out a non-invasive field visit in the field of etnoarcheology and contemporary archeology and numerous animation and community activities in Muszyna. The project adopted an interdisciplinary perspective, contained the methods of contemporary

cultural anthropology and referred to new trends in archeology. Reflection of these two disciplines has been supplemented and verified with knowledge in the history of the region.

Cultural anthropologists used photography, written materials, archives, documents and available studies. The source of knowledge about the past and the present, however, was for them primarily spoken story, stories of people met and heard. As part of historical queries, both general information about the history of the region and about specific places and objects, often insufficiently developed in the scientific literature, were collected.

Meanwhile, in the more widely presented archaeological path, based on the results obtained from field research, attempts have been made to reconstruct the castle's development method, and a 3D reconstruction of the Muszyna castle studied in previous years has been carried out.

The project was implemented from the European Regional Development Fund, Interreg V-A Poland-Slovakia 2014-2020, Axis 1 - protection and development of the natural and cultural heritage of the border area.

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COMMUNITIES, IDENTITIES, RITUALS. THE BRONZE/IRON AGE URNFIELDS AS A PAN-EUROPEAN PHENOMENON

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Baron, Justyna (University of Wrocław) - Liczbińska, Grażyna (Adam Mickiewicz University in Poznań) - Ivanov, Georgi (National Archaeological Institute with Museum – Bulgarian Academy of Sciences, Sofia) - Rottier, Stéphane (University of Bordeaux)

Format: Regular session

The Bronze/Iron Age urnfields covered a vast area and proceeded through chronological periods starting from mid. 2nd millennium BC. Despite long history of research, the urnfield evidence is rarely used in multifaceted studies on Bronze and early Iron Age. The high number of similar forms of pottery – the most common type of urns and/or grave goods in cremation graves resulted in a fact that most archaeologists argue that new discoveries do not improve our knowledge of the past societies considerably. We are however convinced the urnfields deserve high research interests and the data they provide may give us many answers if we try to post new questions.

Main objective of the session is to compare investigatory procedures developed for the Bronze/Iron Age urnfields in various parts of Europe. We invite scholars from various fields to go beyond typological and chronological studies to present results of analysis which are rarely carried out and discussed in the urnfield archaeology: from use-wear studies, analysis of vessels' content to observations of non-metric dental traits, palaeodemography, spatial analysis ect. The main question is: what do we know about the communities that used the urnfields from the data collected over decades? What was their biological and cultural life quality? What was the rules of grave good selection? Were the grave goods new or used? Produced from the same raw materials and with the use of the same technology and expected quality as objects from the settlements? How can we compare data obtained from urnfields and other types of sites (e.g settlements)? How did the demographic profile (mortality and fertility) of the population look like? The urnfields are always sites used for many generations thus the variety of analysed phenomena can be interpreted in diachronic perspective as well.

ABSTRACTS

1 MULTI-LEVEL ARCHAEOLOGICAL APPROACH IN RESEARCH ON CENTRAL EUROPEAN URNFIELDS

Author(s): Baron, Justyna (University of Wrocław) - Kuźbik, Radosław (Iskander, Archaeological Services)

Presentation Format: Oral

There are at least three main characteristics common for most of the urnfield cultures in Central Europe in the late Bronze and early Iron Age: prevailing cremation, intense growth of number of graves and cemeteries and common incorporation of ceramics in funeral rituals. None of these have been so clear in archaeological evidence before the urnfield period and hundreds of pots filled with cremated human bones became an iconic picture of the late Bronze Age in many regions of Central Europe. That opens many research areas on the various levels: from microarchaeology of single urn to broad comparative regional and supra-regional studies. We want to present how this approaches have been realized in selected case studies from Central Europe in three stages of research. First level refers to the characteristics of a single burial or grave. At the second level selected properties of graves are studied both in synchronic and diachronic perspective while third level encompasses intra-site analysis.

This study is a part of the project of the Polish National Centre for Science, NCN UMO-2016/23/B/HS3/00450.

2 TOWARDS A NEW APPROACH TO PALEODEMOGRAPHIC RESEARCH. STUDIES OF THE STATE AND DYNAMICS OF THE SKELETAL POPULATION FROM WICINA (POLAND)

Author(s): Liczbińska, Grażyna - Piontek, Janusz (Institute of Anthropology, Faculty of Biology, Adam Mickiewicz University in Poznań)

Presentation Format: Oral

Critics of paleodemographic research have indicated among others inaccuracy of techniques of age determination, lack of data

reflecting the number of individuals by age and the fact that the samples do not represent a population from which they are drawn. Researchers have omitted paleodemographic methods and have searched for a new methodological approach. In the light of the above criticism of paleodemographic methods, in this work the following issues will be discussed:

1) Paleodemographic research is still an important part of studies of skeletal populations; 2) It is worth looking for new methodological solutions provided that there is a certain criticism of the results interpretation. In order to address the above excursus different research approaches will be applied (classical methods and new ones with the use of software) and possibilities of interpreting the results will be proposed. For this purpose the cremated human remains (N=438 individuals with age and sex determined) excavated from the cemetery at Wicina (the Lusatian Culture), Poland, will be used. Life tables will be built using the classic Halley's method, without/ with the corrected number of the individuals deceased, and without/ with the introduction of the values of natural growth, estimated on the basis of the parameters of the Bocquet-Appel regression function and from the model life tables proposed by Weiss (1973). The biological status will be assessed using the measures of the opportunity for natural selection (biological state index and potential reproductive growth) and the parameters of fertility will be estimated. Next, survival analysis will be applied. This method is useful since there are observation only partially known (underestimated number of children) and the grouping of the time of events into intervals of equal length is not required. Ultimately, the Bayesian models will be used for assessing the uncertainty in the resulting estimates of age.

3 WHAT HOLDS A (CREMATION) GRAVE? EXPLORING POSSIBILITIES OF MULTIDISCIPLINARY RESEARCH OF CREMATION GRAVES

Author(s): Leskovar, Tamara - Črešnar, Matija (Department of Archaeology, Faculty of Arts, University of Ljubljana) - Cavalli, Fabio (Research Unit of Paleoradiology and Allied Sciences, University Integrated Health Care, Trieste) - Vinazza, Manca (Department of Archaeology, Faculty of Arts, University of Ljubljana) - Armit, Ian (Department of Archaeology and Ancient History, University of Leicester) - Bastos, Beatriz (School of Archaeological Sciences, University of Bradford) - Žibrat Gašparič, Andreja (Department of Archaeology, Faculty of Arts, University of Ljubljana) - Innocenti, Dario (Research Unit of Paleoradiology and Allied Sciences, University Integrated Health Care, Trieste)

Presentation Format: Oral

Cremation graves in all their variations are the most numerous type of burials in late prehistoric north-eastern Slovenia. They have a long history of research, which dates back to the 19th century, but it was not until recently, when major changes in research strategies appeared. New technological advances opened doors into a series of new directions. With novel approaches, we can go beyond studying the types of vessels and the selection of jewellery, and begin to search for traces of preparation of the contents, look for possible additional (perishable) grave goods, analyse the composition of objects, take into consideration also post-depositional processes etc.

However, the study of a cremation burial is not a straightforward and self-evident process. We have to acknowledge that we are documenting traces of events and/or processes that we do not understand completely.

The analysis of a grave begins with the analysis of the sites and their surroundings. That includes airborne laser scanning and the analysis of its broader landscape, followed by ground truthing campaigns and geophysical prospections. Ideally, these should precede excavation of the cemetery, when all the possible details have to be observed and documented. However, we can go further in our quest for more detailed and reliable data. An important step forward, when dealing with cremation/urn graves, is the use of computed tomography indivisibly connected with micro-excavations of vessels/urns. Additionally, we can conduct petrography of ceramic vessels, analysis of (possible) organic remains within them, metallography of metal artefacts, as well as the thorough study of cremated human (and animal) remains, which add significantly to the interpretation of the individual graves and their broader (cultural) environment.

4 NEW APPROACHES FOR A NEW BURIAL LANDSCAPE OF THE URNFIELDS IN SOUTHWESTERN EUROPE (FINAL BRONZE AGE - EARLY IRON AGE)

Author(s): Adroit, Stéphanie (LaScArBx; Université Bordeaux Montaigne, UMR 5607 Ausonius)

Presentation Format: Oral

In the south of France and northern Spain, archaeological research on the Urnfields has long focused on two opposing points of view, either in favour of population movements or indigenous developments, to explain the appearance and subsequent generalisation of large cremation necropolises across Europe from the Late Bronze Age onward. These approaches led to dead-ends. In this paper, we leave aside the problem of the origins to focus on the internal components of the phenomenon, in a diachronic way.

We consider that each necropolis is characterized by a set of funerary practices (organization of tombs, architecture of tombs, method of depositing human remains, etc.) which change through time. An analytic grid including 62 descriptors, subdivided in 146 modalities, allows to define what are the funerary combinations specific to each chronological stage of any necropolis. Multivariate statistical analysis and cartography can therefore be used to identify several groups of archaeological sites which share identical or close combinations or have very different profiles, and to study how these groups evolve over time.

Such a bottom-up approach leads to new insights regarding several important questions. This study allows both to highlight the diversity of practices observed in the studied area and the links between some sub-regions previously considered as more or less independent, bringing to light a more complex funerary and cultural landscape. It is then possible to investigate in a new

way the matter of the construction and evolution of past identities in the part of Urnfields zone, while avoiding the pitfalls of the previous approaches.

5 NEGOTIATING DEATH IN URNFIELD SOCIAL PRACTICES OF THE NORTHERN BALKANS: PERSPECTIVES FROM THE SETTLEMENT AND CEMETERY OF GRADISTE IDJOS

Author(s): Molloy, Barry (University College Dublin) - Fibiger, Linda (University of Edinburgh; University College Dublin) - Michael, Dimitra (University College Dublin) - Jovanovic, Dragan (Town Museum of Vrsac) - Mirkovic-Maric, Neda (Institute for the Protection of Cultural Monuments, Serbia)

Presentation Format: Oral

This paper will explore mortuary practices in the earliest Urnfield phases of the Northern Balkans / Southern Carpathian Basin, taking the case of the settlement and cemetery at Gradiste Idjos. Specifically, we will provide new data on the treatment of individuals whose remains were fragmented and deposited in settlement contexts alongside the development from inhumation to cremation in formal flat cemeteries typical to the Urnfield tradition. This transition occurs at the time of the development of Belegis pottery, including a change from the Belegis I style to the Belegis II / Gava style that occurs, in various variants, throughout this wider region. This presentation will incorporate new absolute chronological data for these changes and consider the implications of the transition from inhumation (in graves and other locations) to cremation with reference to changes in land-use and settlement form that were coevally occurring. Our objective is to on the one hand evaluate the chronological parity of these developments and on the other hand to use bioarchaeological research to characterise the populations experiencing these changes.

6 CHANGES IN FUNERARY PRACTICES OF BELGIAN LATE BRONZE AGE/EARLY IRON AGE URNFIELDS.

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Presentation Format: Oral

Cremation was one of the main funeral practices if not the major one in Belgium during the Late Neolithic through to Early Medieval period (up to 700AD). This represents more than 3000 years of Belgian history including the crucial Late Bronze Age / Early Iron Age transition. The analysis of cremated bones plays a key role for understanding palaeodemography, taphonomy and the changes in funerary practices before, during and after that transition. The complexity of studying cremated human remains lies in the high state of fragmentation of the remains and the deformations they underwent during heating (up to 1000°C). Furthermore, the taphonomic damage and post excavation treatment of the remains can erase much of the information present on the bones. Combining a wide range of macroscopic and microscopic techniques offers the opportunity to look into changes in funerary practices through time and space, cremation conditions (oxidizing or reducing, temperature etc.), ante and post-cremation treatment of dead body, mobility, and diet.

The cremated bones from several Belgian Late Bronze Age/Early Iron Age Urnfields (including Velzeke and Blicquy) were studied using osteoarchaeological analysis combined with carbon, oxygen and strontium isotope analysis, infrared (FTIR) and elemental (ICP-MS) analysis. In this paper, we will present and discuss the differences observed between the sites from the methodological and archaeological points of view.

This research is part of the CRUMBEL project (Cremation, Urns and Mobility in Belgium).

7 FUNERAL IDENTITY CONSTRUCTION AT THE END OF THE BRONZE AGE. BURIAL NETWORKS OF THE LATE URNFIELD PERIOD

Author(s): Deicke, Aline (Academy of Sciences and Literature | Mainz)

Presentation Format: Oral

At the end of the Bronze Age, the material record of the late Urnfield period exhibits many of the characteristic traits that only fully emerge within the following Iron Age. Apart from technological change as evidenced by the shift from bronze to iron, this also includes hints at a profound socio-political and -cultural change that is most strongly exemplified by the re-emergence of rich burials in this period. Showcasing a variety of influences from East, West, North, and South, they contain many objects typical of the later Iron Age whose developments can be traced back to the Bronze Age; apart from that, they show patterns of matching funeral expression that appear over nearly all of Middle Europe from Eastern France to the Carpathian Basin as well as distinc-

tively local influences. In this way, they enable us to analyse the way multiple intersecting social identities were materialized in specific selections of grave goods in local as well as overarching contexts. On the one hand, these representations of identity allow us to develop a deeper understanding of the different groups that made up Late Urnfield “elites”, their types and their hierarchies; on the other hand, they also let us draw inferences to the nature of the societies they were embedded in. Employing methods and theoretical concepts of network analysis, the study focuses especially on the way in which the composition of funeral inventories implies varying degrees of social cohesion, and how these findings relate to the development of the structure of Hallstatt society as evidenced in the “princely” graves of the late Hallstatt period, but also on the strategies materialized in grave goods that did not see implementation beyond the end of the Urnfield cultures.

8 RITUAL AND IDENTITY IN THE DANISH IRON AGE URNFIELDS

Author(s): Møller, Niels (Museum Thy)

Presentation Format: Oral

This paper will present the results of a project addressing aspects of Preroman Iron Age identity and socio-cosmology as reflected in the urnfield burial rituals in South-Western Denmark. The project applied in-depth studies of both osteological and archaeological materials from two urnfields in an overall reinvestigation of the Danish urnfield phenomenon.

Minute details in burial ritual and the development of the urnfields show the importance placed on group affiliation and relational identity in the Danish Early Preroman Iron Age society. Strict regulation of burial rites, procedure of cremation and the use of burial goods all minimize individual expression, but urns and burial monuments vary with the age of the individual buried. Use of CT-scans and thorough osteological investigation revealed post-interment curation of bones from some graves, suggesting a prolonged interaction with the deceased, while some urns show signs of ritual dismantling during the burial. The study thus shows the potential of further research into the Danish urnfields beyond mere typo-chronological studies.

9 YOU FIND IT EASIER TO UNDERSTAND THE DEATH OF ONE THAN THE DEATH OF A MILLION: URNFIELD CEMETERIES IN CROATIA

Author(s): Kalafatic, Hrvoje (Institute of Archaeology, Zagreb) - Čavka, Mislav (University Hospital Zagreb)

Presentation Format: Oral

This presentation will present the new insight in the Late Bronze Age of the southern Carpathian Basin and northern Balkans. This region, today parts of continental Croatia and northern Bosnia and Herzegovina, were inhabited by two close related communities known as Virovitica group and Barice-Gređani group.

In past decade several Late Bronze age sites have been thoroughly excavated, so today it is possible to discuss different cemetery patterns, but also of customs and rituals practiced by Late Bronze Age populations in the area. Special attention is dedicated to study of the cremation burial ritual and the organization of cemeteries. In this regard question of existence of grave marks has been examined. Also, the usage of pottery in burial rite showed to be important in understanding the customs of these populations. Analysis revealed that pottery used as furnishings could not be used in common daily activities, but that they were produced intentionally for burial rite. Completely new insight in burial rites was provided with use of computed tomography and Magnetic Resonance technique. With these methods it was possible to obtain valuable information's on refined procedures of funeral ritual.

10 OF INCINERATION BURIALS AND FUNERARY METALS DURING THE LATE BRONZE AGE IN THE EASTERN CARPATHIAN BASIN

Author(s): Daroczi, Tibor (Institutul de Arheologie si Istoria Artei al Academiei Române)

Presentation Format: Oral

Incineration, a relatively new body treatment practice in the Eastern Carpathian Basin (ECB), reaches its full bloom during the Late Bronze Age. This mortuary custom brings significant changes to the funerary milieu and the adjacent finds are not exempted from this either. Dawning from the thesis that metals in funerary inventories would denote individuals of distinct and, possibly, higher status, the contextual evidence is carefully analysed. Furthermore, metal finds are framed in a wider typological scape and are discussed both in synchronous and diachronic relations. These are compared to contemporaneous inventories of inhumation burials from the region, while in the same time metal types not specific to the ECB are tentatively highlighted as main markers for directionalities of flows. Roughly, 80 burial grounds fall within the chronological framework in the study region, out of which circa. 50 contain at least one incineration burial with metal finds. Based on the preliminary analysis, changes in the wider networking can be recognised. Moreover, alterations in metal funerary inventory seen as a barometer of social organisations partially represent metal consumption, mirror perceptions and value systems of the people who carried out the disposal of the body.

11

SOCIAL STRATIFICATION AND THE TIME OF SURVIVAL IN THE LUSATIAN CULTURE. THE CASE OF THE CEMETERY FROM WICINA (POLAND)

Author(s): Liczbinska, Grazyna (Institute of Anthropology, Faculty of Biology, Adam Mickiewicz University in Poznań) - Baron, Justyna (Institute of Archeology, University of Wrocław) - Piontek, Janusz (Institute of Anthropology, Faculty of Biology, Adam Mickiewicz University in Poznań)

Presentation Format: Oral

Social stratification might have been reflected in a selection of grave goods and time-consuming preparation of grave pits. In this presentation, minimal number of vessel per grave (MNVs) and presence of a chamber (reflected in vessel arrangement; PCh) were treated as a proxy for social stratification. We tested the hypothesis that the indices describing differences in social structure could differentiate the time of survival of individuals from different age classes in the Lusatian Culture. The cremated human remains excavated from the urnfield at Wicina, were used for this study. For 438 individuals age at death was determined. The Kaplan-Meier method and Cox proportional hazard were applied. The survival analysis confirmed statistically significant differences in probability of survival between individuals according to social stratification determinants. The probability of survival was higher in the group with greater MNVs (≥ 10) than in the group with MNVs < 10 . Over 80% individuals from the group with MNVs ≥ 10 reached the age of 15. Over 60% of individuals from MNVs < 10 died before the onset of reproduction. To age 40 years survived over 30–40% of individuals from grave chambers with MNVs ≥ 10 , and 10% reached the end of reproduction. In the group with MNVs < 10 the same fractions were as half as many. The Chi-squared test showed that the frequency of MNVs depended on individual's age at death. The greater MNVs (≥ 10) occurred more frequently in adults (70–80%) than in the groups of children (aged ≤ 15). The differences in the times of survival were also statistically significant in favour of the PCh's group. The Cox proportional hazard confirmed that MNVs was significantly related with the time of survival. With some interpretive caution, it can be concluded, that social stratification, analysed by MNVs and PCh indicators, in the community of the Lusatian Culture, could be reflected in the time of survival.

12

BURIED BUT APPARENT. EXAMPLE OF URNFIELD COMMUNITY

Author(s): Šabatová, Klára - Jarošová, Ivana (Masaryk University)

Presentation Format: Oral

This contribution is devoted to the key role that anthropological analysis plays in the general interpretation of burial customs and related social structures. The Urnfield burial site in Přáslavice (Czech Republic) was evaluated in terms of typology, chronology, anthropology, and spatial relations. Social structures were concluded from this evidence. By comparing the results of the anthropological analysis with other, later sites which had been anthropologically processed, it has been shown that the burial site in Přáslavice is structurally different from an anthropological point of view, in particular in regards to the evidence of fewer funerals within a larger population and the absence of funerals for women with children. Based on the assumption that some child funerals have been overlooked, a new anthropological analysis was performed, which not only uncovered evidence of several funerals for children, but also identified other distinct markers that bring into question previous conclusions, including conclusions regarding social structure. However, based on the current analysis, it is possible to point to a certain regularity in the composition of the buried community on multiple sites.

13

ASSESSING MOBILITY AND CONNECTIVITY AT THE BEGINNING OF THE URNFIELD PERIOD

Author(s): Fritzl, Michaela (Austrian Academy of Sciences)

Presentation Format: Oral

The advance of the Urnfield Phenomenon is generally attributed to increased connectivity and mobility. However, various studies have pointed out that the reasons for this change are hard to grasp: explanations range from long term or seasonal migration to residence change upon marriage, moving warrior bands, traveling craftsmen, travel and trade to social visits. Traditional archaeological techniques have reached their limits in exploring which reasons triggered the spread of cremation burials and the homogenisation of the material culture. Bio-chemical techniques provide the means of assessing individual mobility, but the outcomes are rarely sufficiently integrated.

The cemetery of Inzersdorf ob der Traisen, Austria serves as a case study to show that mobility and connectivity should best be explored in an interdisciplinary manner. A combination of strontium isotope analysis, network analysis, analysis of the topographical features of the surrounding area and its connected sites as well as the archaeological assessment of the burials are used to assess to which degree specific kinds of mobility and connectivity can be differentiated, and how they influenced the community of Inzersdorf and its members in their social lives.

We need to know more about which people were more mobile than others, why they were more mobile and how they were perceived within the society to assess the impact of mobility within a society. Furthermore, we need to deepen our understanding of how mobility and connectivity were shaped and shaped the communities, in order to understand the dynamics of cross-cultural communication and finally of cultural shifts.

- 14 THE CO-EXISTENCE OF URN-FIELDS WITH OTHER BURIAL PRACTICES IN THE BRONZE AND EARLY IRON AGE OF THE CENTRAL BALKANS**
Author(s): Ivanov, Georgi (National Archaeological Institute with Museum - Bulgarian Academy of Sciences)
Presentation Format: Oral
- Here we discuss the elements and the structure of the burial practices of cultures with urn-field ne-cropolises, as well as what distinguishes those from the cultures practicing inhumation in flat or tumular necropolises.
- Urn-field necropolises appear prior to 1400/1300 BC, and are synchronous to the Verbicioara phase III. Subsequently, they emerge as the dominant burial practice of the Central Balkans, while absent from the adjacent regions. By the HaA2 period, urn-fields are already near extinct.
- Most characteristic of the urn-field necropolises is the practice of depositing the urns in a single level, arranged in a linear or radial pattern, with space between the structures. The urn-fields occupy comparatively large areas. In most instances, burial practices include the interment of the remains in a container-urn, which is sometimes covered by a bowl-lid. In one in five burials were attested gifts, most commonly pottery vessels and bronze adornments. In several necropolises it is possible to establish a connection between the built burial structure and the position of the structure within the necropolis, making possible the distinction of certain chronologically discrete groups of graves.
- In some urn-field graves there are dedicated stone structure around a feature – a tradition attested in inhumation necropolises. The pottery vessels found in both principle types of necropolises, as well as in inhumation necropolises in general, find parallels in the southern parts of the Central Balkans. Urn-field necropolises are relatively uniform, while inhumation necropolises manifest greater variability and local specifics.
- 15 URNFIELD OR NON-URNFIELD? - SO-CALLED LOWER ODER VERSION OF LUSATIAN CULTURE**
Author(s): Slusarska, Katarzyna (University of Gdańsk)
Presentation Format: Oral
- Urnfield phenomenon of the late Bronze and early Iron ages is defined by the presence of vast urn cemeteries. And here we have three most unified elements of the phenomenon: cremation as a one and the only way of dealing with the dead, a pot as a container for the ashes and flat grave. There is also a complementary list of secondary features that should be present to include a unit in question into urnfield phenomenon. However, looking deeply into the detailed characteristic of cultural sets and comparing them from region to region there always some "but". There are the exceptions in funeral practice - like inhumation, or barrow grave, wooden coffins and so on. Lower Oder region shows slightly different dynamics and characteristics. The Bronze Age here has started with delay gaining full expression within the Urnfield period. Similarly, the end of the Bronze Age is also shifted here into the end 1 half of I millennium BC. The beginning of the Urnfield period brings cremation as a sole funeral rite, but urn with ashes is placed under burial mound and equipped with numerous bronze objects.
- Based on Lower Oder late Bronze and early Iron Ages material I'm going to test different ways of defining a cultural phenomenon according to typology and definition applied in archaeology.
- 16 LATE BRONZE AGE METALWORKER GRAVES**
Author(s): Nowak, Kamil (Institute of Archaeology University of Wrocław) - Stolarczyk, Tomasz (Copper Museum in Legnica)
Presentation Format: Oral
- Discovering of the so-called specialists graves, in this case bronze smiths, in urnfields is a rare phenomenon. Studies of this type of graves usually focus on the typo-chronological analysis of the equipment and the determination of sex and age of the buried individual. Aspects related to the technological side of the equipment are very rarely studied. Macro- and microscopic observations of objects such as casting moulds or casting cores allow to specify the type of raw material from which they were made and to determine the method of their production. Thanks to specialist analyses it is possible to determine whether the objects (moulds, cores) were used, and if so, what was the way they were used in the casting process. The paper deals with the methods of identifying of metallurgists graves, characteristics of metalworking equipment and interpreting of such phenomenon in the funerary practice. In addition, it will be presented the research possibilities that can be carried out while analyzing this type of graves.
- This study is a part of the project of the Polish National Centre for Science, NCN UMO-2016/23/B/HS3/00450.
- 17 FROM THE KITCHEN TO THE GRAVE. LIFE CYCLE OF POTTERY ON THE EXAMPLE OF SETTLEMENT MICRO REGION IN WICINA (POLAND)**
Author(s): Laciak, Dagmara (Institute of Archaeology, University of Wrocław) - Borowski, Michał P. (Independent Researcher) - Bartz, Wojciech (Institute of Geological Sciences, University of Wrocław) - Stoksik, Henryk (Faculty of Ceramic and Glass, Academy of Art and Design) - Kuźbik, Radosław (Independent Researcher) - Lucejko, Jeannette J. - Nardella, Federica (Department of Chemistry and Industrial Chemistry, University of Pisa) - Baron, Justyna (Institute of Archaeology, University of Wrocław)
Presentation Format: Oral
- Urnfields produced an enormous number of pottery which was studied mostly according to its chronological and typological

indicators. It has been commonly agreed that they were made specially for the funeral purposes. Thanks to wider perspective which incorporate multi- and interdisciplinary studies we could introduce new information about pottery which was involved in the social and cultural life of a small community at Wicina, SW Poland.

We posted new questions about pottery in settlement and in cemetery contexts. Are vessels produced and used in settlement area reused as funeral ones? Or were they made especially for burials? What the pathway from settlement to cemetery looked like?

Great opportunity to answer gives Wicina, which belongs to a settlement micro region (fortified settlement and a few of cremation cemeteries). The settlement is located ca. 800 m from the one of the cemeteries and can be dated with a dendrochronological method to mid.8-mid.6th c. BC. The cemetery is dated to ca. 13-6th c. BC. Such a broad chronology allows observations of patterns in ceramics production and use in a long-time scale. We could find out about cultural properties of the community which buried their dead at the urnfield before and after the fortified settlement was constructed, what is unique both in Polish and Central European archaeology.

Previous results of artefacts analyses obtained at the settlement will be compared to new ones conducted on grave pottery. Investigations of pottery involved physical, petrographic, SEM-EDS and DTA analyses. The chemical study of organic residues from pottery by GC-MS analyses, in order to determine their use was also completed. Some of spatial investigations on grave pottery sets and the comparison to settlement pottery will be presented as well.

This study is a part of the project of the Polish National Centre for Science, NCN UMO-2016/23/B/HS3/00450.

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BREAKING OLD PARADIGMS: THE ARCHAEOLOGY AND ETHNOARCHAEOLOGY OF PASTORALISM IN THE INNER AREAS OF THE MEDITERRANEAN BASIN

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Giannitrapani, Enrico (Arkeos - Servizi integrati per i Beni Culturali s.c.) - Mientjes, Antoon (Econsultancy, Netherlands)

Format: Discussion session

Pastoralism is one of the main economic activities for all those communities that, both in the past and today, settled in the Mediterranean basin. This particular mode of production implies the existence of specific ways of managing land resources, settlement patterns, production of material culture and social structures. Despite its economic and social value, however, pastoralism has often been considered as a somehow backward activity in the prehistoric Mediterranean, particularly when compared with the supposedly more advanced societies whose economies were based on the so-called Neolithic package (agriculture, sedentism, etc.). Furthermore, pastoralism is characterised by a high level of mobility and by a large array of immaterial cultural aspects, often making its practice invisible within the archaeological record.

Multi-proxy analyses are recently contributing to re-evaluate the key role of pastoralism in the constitution and development of ancient societies and landscapes. This traditional activity can be also usefully investigated through the use of models and analogies developed within ethnoarchaeology, since its practice is particularly conservative through time. In the session we intend to investigate the different aspects connected with prehistoric pastoralism, focusing on the inner areas of the Mediterranean macro-regions, such as the Iberian and the Italian peninsulas, and of its large islands (e.g. Sicily, Sardinia, Corsica). These areas, showing substantial social, economic and cultural differences from both the coastal and the mountainous ones, often are under-represented in the current archaeological narrative. We thus welcome papers adopting archaeological and ethnoarchaeological perspectives and contributing, though not exclusively, to the following themes:

- bioarchaeological, geophysical and archaeometric analyses
- production/consumption of material culture
- domestic, productive and funerary architectures
- economic modes of production (weaving, dairy, transhumance, etc.)
- spatial and GIS analyses, communication routes, settlement and mobility patterns
- immaterial aspects of pastoralist societies
- social complexity of pastoralism

ABSTRACTS

1 ARCHAEOLOGY AS A PROXY FOR SOCIAL COMPLEXITY. CAVE SETTINGS, PASTORALISM AND RITUALITY DURING THE COPPER-EARLY BRONZE AGE IN NORTH-WESTERN TUSCANY

Author(s): Bilotti, Giacomo (Padua University; Centro Studi di Preistoria e Archeologia di Milano - CSP) - Metta, Christian (Pisa University; Centro Studi di Preistoria e Archeologia di Milano - CSP)

Presentation Format: Oral

Our presentation intends to address the reconstruction of social complexity and the human-landscape relationship in north-western Tuscany during the Copper Age and the Early Bronze Age. This was a period of great changes both in social and environmental terms, in which new phenomena took place and the first signs of inequality started to emerge. This concept is already well-known

but still poorly studied within a solid theoretical framework considering landscape, human cognition and behaviour. The current debate for this area is still stuck to the mere, though essential, description of the material culture. This is partially due to the early discoveries of many archaeological contexts in this area, such as the statue-stelae and many of the caves considered in this study, but some preliminary results have proved to be fruitful.

The first step concerns a critical review of the already-known archaeological sites in North-Western Tuscany, in order to set up a reliable basis for the following analyses within a GIS environment. Thereafter, we will build a model to track mobility and perception throughout the landscape in the study area, trying to understand diachronic patterns, since many variations in the use of cave settings or statue-stelae are recorded. Moreover, we will propose a reconstruction of the visualscape, following the evidences from cave settings (ritual and funerary) and other important landmarks (statue-stelae).

Finally, we will test and further develop the well-established idea of a pastoralist society, building an optimal grazing model. This will be based on environmental conditions, ethnohistorical information and archaeological data. The most probable path followed ("transhumance route") will be based on two different cost surfaces: one anisotropic and energy-based and one based on the previously defined visualscape. This will permit to address the social complexity in a more robust and quantitative way, contributing to the current archaeological debate.

2 CROSSING PEAKS AND VALLEYS: MOBILITY AND SETTLEMENT PATTERNS IN THE APENNINES (MOLISE, ITALY) DURING THE BRONZE AGE (2ND MILLENNIUM BC)

Author(s): Lucci, Enrico - Mironti, Vittorio - Modesto, Rachele - Cazzella, Alberto (Sapienza - Università di Roma, Dipartimento di Scienze dell'Antichità)

Presentation Format: Oral

Inland areas of central-southern Italy preserve an incredible cultural palimpsest, ranging from Paleolithic sites to traditional pastoral structures. In fact, until the mid of the last century transhumant pastoralism represented a significant resource for the local communities' economy, influencing social and cultural aspects. The high mobility associated to this practice is testified by a dense and wide network of communication routes that connect mountainous areas to inland and coastal plains. The importance of pastoralism for the Bronze Age economy is well known, hence, the spread of models of material culture in that period could reflect an accentuated dynamism also for the communities of the 2nd millennium BC.

Starting from 2015, the Molise Survey Project has focused on the human exploitation of mountainous inland areas of the central-southern Adriatic Italy over the prehistoric periods. A remarkable number of sites, scattered across the whole researched area, has been recognized that mostly belongs to the 2nd millennium BC. Bronze Age sites are mostly located along ancient communication routes and/or in strategic high-altitude grazing land. They have yielded a huge number of diagnostic pottery sherds linked to production, transformation and consumption of primary goods.

In this presentation we will propose an integrated analysis of the 2nd millennium BC settlement pattern and the historic evidences linked to transhumant pastoralism, with a focus on the relationship between the Bronze Age sites and the communication network represented by the "tratturi". By means of GIS elaboration we will try to understand patterns of mobility across inland areas during the 2nd millennium BC, challenging the traditional model of mobility based exclusively on the large valleys connecting the coastal area to the inland.

3 PALYNOLOGICAL APPROACH TO RECONSTRUCT PASTORAL ACTIVITIES: CASE STUDIES FROM BASILICATA, SOUTH ITALY

Author(s): Florenzano, Assunta - Clò, Eleonora - Mercuri, Anna Maria (University of Modena and Reggio Emilia)

Presentation Format: Oral

A palynological approach to the study of Mediterranean landscapes is ideally suited for detecting the land-use history and environmental changes that gave rise to the present-day Mediterranean landscape. In particular, the combined evidence of pollen and non-pollen palynomorphs (NPPs, such as fungal spores and algal elements) from archaeological sites is useful for tracing the impact of past human activities on the environment, and also to discriminate past land uses and pastoral practices. In Italy, an outstanding number of studies that include pollen or other plant remains from archaeological contexts (BRAIN database: brainplants.successoterra.net; [1]) have testified to the widespread occurrence of pastoral activities on the peninsula over the last few millennia.

This contribution reports on palynological evidence for the impact of centuries of grazing on the vegetation of Basilicata, a region of southern Italy where animal breeding and pastoralism have a long tradition. The integrated analyses of microscopic records from eight archaeological sites (dated from the 6th century BC to the 15th century AD) indicate wide and continuous pastoral activities practiced in the region [2]. The combined evidence from pollen pasture indicators and NPP markers of grazing (mainly coprophilous fungal spores) point out that pastures were the main type of land-use in the territory surrounding each of the eight study sites. As evidenced by the pollen records, this region has long been a grazed area, with more intense pastoral activities documented from the end of the Hellenistic age to the Medieval and Renaissance periods. This research confirms the economic importance of pastoralism in the past communities and its prominent role in shaping the Italian landscape.

References

[1] Mercuri et al. 2015. Review of Palaeobotany and Palynology 218: 250-266.

4 REVISITING THE ITALIAN SHEPHERD: FROM THE PREHISTORIC PAST TO CONTEMPORARY CHALLENGES

Author(s): Albarella, Umberto (Dept of Archaeology, University of Sheffield)

Presentation Format: Oral

Pastoralism has played a key role in the history of Italian communities. Though well known for its coasts, Italy is a largely mountainous country and this altitudinal variation has meant that seasonal mobility had to be implemented as a strategy to care for livestock efficiently. This is what is generally known as 'transhumance', a key feature of many pastoral societies. This lifestyle has a deep history, dating back to at least the later prehistoric period, with some societies, such as those belonging the Bronze Age Apennine culture, traditionally associated with a pastoral way of living. The Italian shepherd has remained a central figure in the development of Italian societies also in historic times, with some of the best known transhumance routes (the so-called tratturi) dating back to medieval and early modern times. In this paper I will explore the perception of historical pastoralism in contemporary society and evaluate how archaeological and ethno-archaeological evidence can help in the understanding of its sociological and ecological value. Examples will be drawn from my work in the Apennine area and Sardinia.

5 HOW OLD IS YOUR PASTORALISM? THE QUESTION OF DATING VERNACULAR STRUCTURES

Author(s): Popovic, Sara - Bulić, Davor - Matijašić, Robert - Gerometta, Katarina (Juraj Dobrila University of Pula)

Presentation Format: Oral

Airborne laser scanning (ALS) has shown its potential numerous times in archaeological research of forested areas. In the dense Mediterranean woodlands, it proved to be an irreplaceable technique which almost instantly brings to light countless dry stone structures – the main constituents of karstic landscapes. This is also the case in Vrsar municipality on the Istrian peninsula which will be shown as a case study in search of these diachronic structures which reflect traditional land management practices. When compared to surface morphology, which can also be read from ALS data, we can conclude that built structures are best preserved in areas of poor soil where bedrock is visible on the surface. This land was not suitable for cultivation and for that reason the most commonly preserved structures are the ones reflecting activities related to pastoralism: boundary walls, pens, enclosed paths, funnels etc. The differences between arable and pastoral land use affected the survival of structures on those lands and changes in the pastoral areas were more gradual than those in fertile areas. This means that we are simultaneously looking at numerous multi temporal remnants of past land uses. There are remains that could be assigned to the Bronze Age, then ones reflecting major transformations that re-shaped the landscape with no continuity in Roman period, but we are also dealing with numerous features which cannot easily be dated but rather classified into time sequences. This presentation will discuss the possibilities and challenges of dating these vernacular structures by (GIS supported) analysis of different types of data such as ALS, modern and historic aerial photographs and cadastres collated with structural surveys.

A. HALF FARMERS, HALF GATHERERS: ETHNOARCHAEOLOGY OF FORAGING IN THE AEGEAN BASIN

Author(s): Zervoudakis, Panagiotis (Dpt. History-Archaeology, University of Crete)

Presentation Format: Poster

The ethnoarchaeological and ethnohistorical study of foraging practices in Crete and other Aegean Islands will cover the activity of contemporary foragers in inland and coastal areas, based on seasonality, the differentiation of these practices according to gender and age, and their importance in the economy of the household or the wider social group. These elements are reflected in the practices of gathering wild plants, molluscs and salt by modern agricultural populations which can give clues and lead to the formulation of analogies for societies of the past.

The archaeological evidence for the foraging practices result from residues of fauna, phytoliths and charred fruits and seeds, skeletal remains and coprolites which give information on the diet of prehistoric populations and their specialized toolkits. Modern gatherers in the Aegean collect a variety of foods such as landsnails, molluscs, wild greens and herbs, mushrooms, and salt, either as part of their diet or as a means to increase their incomes. Some of these foods are consumed exclusively in the Aegean, and most of them, if not all, were also gathered by prehistoric foragers. Sites with landsnail consumption have been located across the Mediterranean dating to the late Pleistocene and early Holocene, which are being studied as a possible indicator of the transition from the Mesolithic to the Neolithic. Salt has always been an equally important food supplement which was necessary, not only for its taste, but also for the preservation of food.

An overview of these contemporary foraging practices from the rural areas of Crete and other islands of the Aegean Sea will be compared to archaeological evidence in order to draw analogies between past and present foraging practices, as well as possible consequences of environmental change on the quality and availability of these resources.

ANCIENT TEXTILE PRODUCTION FROM AN INTERDISCIPLINARY APPROACH: HUMANITIES AND NATURAL SCIENCES INTERWOVEN FOR OUR UNDERSTANDING OF TEXTILES

Theme: Archaeological theory and methods beyond paradigms

Organisers: Ulanowska, Agata (Institute of Archaeology, University of Warsaw) - Grömer, Karina (Natural History Museum Vienna) - Dyer, Joanna (British Museum, London) - Vanden Berghe, Ina (Royal Institute for Cultural Heritage, Brussels)

Format: Regular session

Nearly ten years have passed, since E. Andersson Strand, K.M. Frei, M. Gleba, U. Mannering, M.-L. Nosch and I. Skals published the paper 'Old Textiles – New Possibilities' (EJA 13.2, 2010), in which they presented a comprehensive overview of integrated, multidisciplinary approaches to studies on ancient textiles. Now, such approaches have become standard in textile archaeology, and new, emerging technologies are making their contributions felt.

In this session we aim to update this first overview by Andersson Strand et al., by presenting the current state-of-the-art, and by highlighting these new methods, as well as new possibilities in textile research. We welcome papers referring to a wide geo-chronological framework, starting from c. 4th millennium BCE to c. 500 CE, and covering a large area, from Europe and the Mediterranean, to the Near East and Asia.

We are particularly interested in all papers discussing the following aspects of textile archaeology:

- Human modifications of fibrous plants and woolly animals (e.g. analyses of archaeobotanical and archaeozoological data, patterns of transmission of plants and animals);
- Research on raw materials (e.g. conventional and improved analytical tools like SEM, wool quality measurements, isotopic tracing, proteomics, sheep DNA, metal thread analysis, processing of fibres, etc.);
- Textile analysis (e.g. splicing vs. spinning, textile imprints, composition of fabrics, creation of pattern types, etc.);
- Dyes and dye-stuffs (e.g. identification of dye-stuffs and composition of dyes; destructive and non-destructive methods);
- Research on textile tools (e.g. use-wear, geometry of tools vs. their functionality);
- Socio-economic background of textile production (e.g. craft specialization, production modes, patterns of transmission of skills);
- Big data in textile archaeology (e.g. statistical methods; critical evaluation of data and methods);
- Multidisciplinary research projects in textile archaeology; integrating data from different disciplines into interpretations and narratives.

ABSTRACTS

1 ACHAEMENID AND SASANID TEXTILES AND DYES FROM ANCIENT PERSIA. CASE STUDY CHEHRĀBĀD IN NORTHERN IRAN

Author(s): Groemer, Karina (Natural History Museum Vienna, Austria) - Vanden Berghe, Ina (KIK IRPA Brussels)

Presentation Format: Oral

The salt mine Chehrābād in northern Iran offers good preservation conditions for organic finds of all kinds (wood, botanical remains, human faeces, textiles, ropes, leather and fur objects, human mummies ...). More than 15% of all artefacts found in the waste layers of the salt mine are textiles, most of them covering roughly a time-span between c. 5th century BCE to 6th century AD, which refers to the Achaemenid and Sassanid Period of the Persian Empires. As the salt mine was also used during Islamic period, related to Safavid and Qajar periods (between the late 14th century and early 20th century AD).

Within the framework of a recent research project under the leadership of the ICHTO Zanjan and the German-Mining Museum, focus lies on interdisciplinary textile research, including diverse analytical tools to gain basic data, C14 dating, isotopic tracing, fibre analysis and wool measurements, dyestuff analysis and advanced conservation methods. The textiles from Chehrābād are an important source for our understanding of textile technology of the Near East and the Persian Empires.

As so far more than 1000 textiles are known from the site, covering a wide time-span, also intensive on-site studies are possible to answer different research questions such as the development of textile technology, imports and trade. The number of textiles is of statistical relevance and such first concise summaries can be given about the preferred fibre material, weaving and patterning techniques. Furthermore we will focus on the dyestuff analysis and the methodology used.

The integration of data from different disciplines into interpretation and narratives about the site Chehrābād is then the next step in preparing a travelling exhibition about the site and its textile finds, that will open in Frankfurt in 2020, with further stations in Bochum (Germany), Tehran and Zanjan (Iran).

2 BLUE AND WHITE ALONG THE MIDDLE NILE: THE MEROITIC ELITES AND THEIR PASSION FOR INDIGO

Author(s): Yvanez, Elsa (Centre for Textile Research, University of Copenhagen) - Biesaga, Magdalena (Laboratory of Chromatography and Environmental Analysis, Faculty of Chemistry, University of Warsaw)

Presentation Format: Oral

Seemingly far from the contemporary textile traditions of the Mediterranean basin and the Egyptian Nile valley, the Meroitic

populations living in Nubia and Central Sudan during the first four centuries of the Common Era developed a unique textile style. Immediately recognizable, the textiles are most famous for their extensive use of cotton fiber and blue decorations in tapestry and embroidery, displaying a blend of patterns from pharaonic, Kushite and Hellenistic heritage.

This presentation offers new insights in this unique textile tradition, using methods of both the natural sciences and the Humanities. It focuses on the iconic blue textiles, firstly by detailing the raw material and the techniques used for dyeing fibres, and secondly by exploring the symbolism of the color blue in the sartorial display of the ancient Meroitic populations. High performance liquid chromatography with mass spectrometry was applied for the identification of dyes on well preserved funerary textiles from Karanog. The results achieved from chemical analysis allowed to describe the importance of blue dyes and textiles in the construction of the Meroitic elite's wardrobe, replacing this textile production within the greater context of fashion and power along the Nile Valley and in Sahelian Africa.

3 **A MULTISPECTRAL IMAGING APPROACH INTEGRATED INTO THE STUDY OF ARCHAEOLOGICAL TEXTILE COLLECTIONS AT THE BRITISH MUSEUM**

Author(s): Dyer, Joanne - Tamburini, Diego (The British Museum)

Presentation Format: Oral

Multi-analytical approaches, combining the use of non-invasive and micro-invasive techniques, are increasingly being applied to the study of historical and archaeological textile collections, with particular attention to the technology of textile production, dye stuff sources and dyeing practices. By contrast, although the use of multispectral imaging (MSI) techniques is well-established in the study of polychrome surfaces, these have only been sparingly, and often unsystematically, applied to the investigation of textiles.

This work summarises some of the research recently undertaken at the British Museum that applied MSI techniques to the investigation of two groups of archaeological textiles from the British Museum's collections: Some examples of Late Antique (c. 250-800 AD) textiles from Antinopolis and Wadi Sarga, Egypt, and a series of textile fragments from Dunhuang, China, dated from the late 7th to the early 10th century (Tang to Five Dynasties period). The aim is to show how this non-invasive, relatively inexpensive, portable methodology can be used to map the photoluminescence and reflective characteristics of textiles under different wavelengths of light. Standardised acquisition and post-processing methods were applied to produce a series of images that provided preliminary indications of the colourants used and their spatial distribution.

To assess the potential and limitations of relating multispectral data to chemical properties, the information derived from these images was compared to the more detailed information provided by complementary non-invasive techniques, such as fibre optic reflectance spectroscopy (FORS), and micro-invasive approaches, such as high-performance liquid chromatography mass spectrometry (HPLC-MS).

Two salient points emerge: MSI techniques show a high degree of potential for the investigation of textiles in museum/historic collections, particularly as part of a protocol combining digital microscopy, FORS, SEM-EDX and HPLC-MS. Secondly, that within this protocol, MSI is an excellent aid in planning more targeted and effective sampling strategies and facilitates comparisons between objects.

4 **ADDRESSING THE CHALLENGES OF DISASSOCIATED ARCHAEOLOGICAL TEXTILES WITH MULTIVARIATE CLASSIFICATION OF SPECTROSCOPIC AND CHROMATOGRAPHIC DATA**

Author(s): Alcantara-Garcia, Jocelyn (University of Delaware) - Weldon, Marianne (Bryn Mawr College) - Booksh, Karl - Miller, Amelia (University of Delaware)

Presentation Format: Oral

The chemical analysis of archaeological textiles faces four major challenges: contamination, sample size, degraded constituent materials, and the likelihood of ancient cultures using plants that are now extinct. These troubles are oftentimes exacerbated by occasional dubious provenance. Innumerable archaeological textiles were illegally traded to private collections in the early 20th century, and some of such objects have been donated to educational institutions such as Bryn Mawr College, Pennsylvania, in the United States. Now part of the College's collections, hundreds of archaeological textiles, ranging from Coptic to Andean, have been classified by style only. Using a combination of chromatographic and spectroscopic techniques, we studied a statistically representative number of likely Peruvian textiles at Bryn Mawr. Multivariate analysis allowed us to see differences in constituent materials across textiles of Pre Columbian Peru. Our early results will likely serve as a model, and probably aid in giving provenance to other disassociated, similar, textiles.

5 **CARBONIZED LINSEEDS FROM TEL BURNA, ISRAEL. FLAX CULTIVATION INTENDED FOR TEXTILE PRODUCTION?**

Author(s): Orendi, Andrea (Institute of Archaeological Sciences, Eberhard Karls University of Tübingen) - Cassuto, Deborah (Department Land of Israel Studies and Archaeology, Bar Ilan University Ramat Gan) - Shai, Itzhaq (Department Land of Israel Studies and Archaeology, Ariel University)

Presentation Format: Oral

Linum usitatissimum L. was and still is cultivated either for textile production or for oil production. According to their specific use the flax plants differ in height and branching. Similarly, the linseeds vary in size in that way that linseeds for oil production are

larger and heavier than linseeds from flax plants intended for textile production.

Various archaeobotanical studies of ancient linseeds were able to identify for which purpose *Linum usitatissimum* L. was cultivated with the help of measuring length and width of the seeds. Yet, carbonization of archaeobotanical macro remains often result in shrinking and deformation of the seeds and limits the meaningfulness of morphometric analyses.

Tel Burna is located about 30 km southwest of Jerusalem and dates to the Late Bronze and Iron Age. Linseeds have been found at the site in several contexts. Evidence for weaving (clusters of loom weights) found within the city's fortification walls, may point towards the cultivation of flax for linen production. Excavations in the summer of 2018 concentrating on early Iron Age strata (1200 – 975 BCE) outside the fortification wall, exposed an area of destruction revealing hundreds of charred linseeds in proximity to complete storage vessels. The carbonized linseed finds from Tel Burna will provide the basis for establishing a method to distinguish if archaeobotanical macro remains are residues of flax cultivation intended for oil or for textile production.

6 BLIND TESTING: AN EVALUATION OF PLANT FIBRE DIAGNOSTIC FEATURES

Author(s): Waudby, Denis - Thompson, Gillian - Evans, Adrian (University of Bradford)

Presentation Format: Oral

A range of natural fibres is likely to have been used in prehistoric material culture across northern Europe. Consequently, understanding the fibres used under specific circumstances contributes to archaeological interpretation of sites and societies. Techniques from material science are applied to fragmentary, degraded archaeological samples, e.g. fibre morphology is conventionally used by textile specialists to identify archaeological bast fibres. Here, two aspects (1) microfibrillar angle (MFA) and (2) cross-sectional circularity (Ct) are evaluated in terms of their reliability for distinguishing between nettle (*Urtica dioica* L.), flax (*Linum usitatissimum* L.) and hemp (*Cannabis sativa* L.). We present results from controlled blind testing of randomly selected samples of minimally processed fibres (16 examples of each species). For each sample, the MFA and Ct were recorded, a diagnosis attributed then the identification compared against the known identity. The success rates for identification were compared, using MFA and Ct individually and in combination. Initial results showed differences in terms of the success rates in identifying the three fibres, and that the reliability of the two techniques varied. When the MFA was used alone in the blind tests, hemp was successfully identified in 81% of cases, 50% of the nettle fibres were identified correctly and only 31% of the flax. When Ct was used alone, flax was most reliably identified (75% of the samples), followed by nettle (38%) and hemp (25%). Using the two methods together generated the highest rates of correct identification: hemp 81%, flax 63% and nettle 63%. For the 48 samples overall, the success rate using the identification criteria together was 69%. It can be concluded then, that it is important to take both MFA and Ct into consideration when diagnosing unidentified material, and that blind testing is a valuable approach to appraising diagnostic methods.

7 SINGULAR DETERMINATION OF THE MALACOLOGICAL PROVENANCE OF ROYAL PURPLE

Author(s): Koren, Zvi (The Edelstein Center for the Analysis of Ancient Artifacts; Department of Chemical Engineering; Shenkar College of Engineering, Design and Art)

Presentation Format: Oral

The purple pigment produced from various Mollusca has been found on a number of archaeological artifacts, such as Aegean wall paintings from nearly four millennia ago to Greek and Roman textile dyeings – often referred to as Tyrian Purple – dating from 3,000- and 2,000-years ago. It is well known that in the Eastern Mediterranean, a purple pigment can be extracted from three different marine species of the Muricidae family of mollusks: *Hexaplex* (= *Murex*) *trunculus*, *Bolinus* (= *Murex*) *brandaris*, and *Stramonita* (= *Purpura*) *haemastoma*. However, modern researchers have grappled with various questions associated with this ancient "Dye of Dyes": Were all three species equally used or was one species always, or primarily, used with possible additions from the others? What were the exact procedures by which dyeings with this molluscan pigment were performed with the tools and natural materials available to the ancient dyer? Was Pliny correct in his classic description of the purple dyeing process? Which peoples were the first to develop the dyeing process? How many sea snails were needed for the dyeing of one royal cloak?

In order to answer these questions, micro-analyses on modern and archaeological purple pigments were performed via the high-performance liquid chromatography (HPLC) technique, the optimal method for such multi-component investigations. From a quantitative comparison of the main indigoids possibly present in the purple pigment – purple dibromoindigo (DBI), violet monobromoindigo (MBI), and blue indigo (IND) – as well as related components, it is apparent that the *H. trunculus* species is different from all other sea snails. This discovery together with the archaeo-chemical record and a reconstruction of the ancient purple dyeing process has provided revolutionary insights regarding the most royal and sacred of all dyes – the purple pigment – and has given singular answers to the above-mentioned questions.

8 NEW OPPORTUNITIES FOR TEXTILE RESEARCH USING MACRO X-RAY FLUORESCENCE SCANNING: THE INVESTIGATION OF METAL THREADS IN A RELIQUARY PURSE

Author(s): Vanden Berghe, Ina - Van Bos, Marina - Vandorpe, Maaïke (Royal Institute for Cultural Heritage - KIK-IRPA)

Presentation Format: Oral

X-ray fluorescence is a known non-destructive technique for the investigation of various historical objects. On textiles, it might be used to analyze the element composition of metal threads based on single point measurements with spot sizes ranging from a few mm to less than 0.1 mm. The development of portable instrumentation a decade or more ago, brought further opportunities

allowing on-site measurements. However, multiple single point analyses are still needed to identify the materials used and to obtain a correct interpretation of individual spectra. The recent development of the macro X-ray fluorescence mapping technique brings new interesting opportunities for textile research. With this technique, it is not only possible to characterize the different elements on a single spot in a non-invasive way but also to visualize the element distribution over the whole investigated area.

In the presentation, we will discuss the application and the possibilities of the imaging technique for the study of metal threads present in two extremely fine reliquary purses, belonging to the collection of the Provincial Museum of Ancient Art of Namur (Belgium), whose current state of preservation is a major obstacle to sample-taking. In addition to the analyses of the dyes of only a few samples, macro X-ray fluorescence scanning is used to define the composition of the remaining metal threads, to reveal details of the textile composition by visualizing the patterns made by the metal threads, and to evaluate the condition of the textile as the XRF-images clearly illustrate the metal threads missing in the patterns.

9 RECONSTRUCTING LATE ROMAN AND EARLY MEDIEVAL SILK SAMITES FROM EGYPT. RESEARCH ON TECHNIQUES AND LOOMS WITH A PRACTICAL APPROACH

Author(s): Köstner, Barbara (Universität Bonn; Deutsches Textilmuseum Krefeld; Haus der Seidenkultur)

Presentation Format: Oral

In the late 19th century many silken weft-faced compound twills have been discovered in necropolis in Egypt. They are now distributed to museums all over the world. The burials where the garments have been found have been dated to 4th-9th centuries AD, but due to their early discovery most of the silks have been separated from their original garments and lack a secured context.

The PhD-project "Complex silk fabrics from the area of the Roman Empire from Late Roman and Early Medieval times" gives these precious fabrics back some of their context. Located at the University of Bonn, Department of Christian Archaeology, it investigates western silk samites, their origin, manufacturing process and distribution. While the recent history of the objects is one part of the research, the main part focuses on the detailed technical analysis of the preserved textiles: The non-invasive visual analysis of yarns, warp and weft proportions, pattern width, steps and weft sequences allows to draw very detailed conclusions on the technique that was employed to produce these weft-faced compound twills. Mapping irregularities in the finely woven fabric, mounting and weaving faults helps to trace pieces of the same production units and to reconstruct the actual weaving process.

The silk samites at the Deutsches Textilmuseum Krefeld act as an example for analysis. Their technical features will be examined in detail and tested in practice: Together with the skilled silk-weavers at the Haus der Seidenkultur Krefeld the techniques are reproduced with simple handlooms and theories are reviewed. Later a workshop will teach the technique of weaving samite to scholars and researchers. This workshop-project, which is funded by the Sparkassen-Kulturstiftung Krefeld, engages the centuries-old knowledge of silk weaving in modern textile research and passes on the fascinating technique of these luxurious Late Roman fabrics.

10 INTERDISCIPLINARY METHODS AND NEW PERSPECTIVES ON INSCRIBED TEXTILES: CHRISTIAN 'TIRAZ'

Author(s): Galliker, Julia (University of Michigan) - Rösler-Mautendorfer, Helga (Inscribed Textile Research Team)

Presentation Format: Oral

World collections include an important group of textiles with inscriptions in Coptic and Greek dating from the late Antique and early Islamic periods in Egypt. The appearance of a distinctive Christian form of 'tiraz' demonstrates the intersection of religious cultures. These textiles functioned on various levels as textual documents as well as intimate personal objects. They contain extensive information pertaining to cultural practices, religious beliefs, social relationships and production processes.

To date, we have found over 250 inscribed fragments in European and North American collections. Among these, an important group of shrouds is remarkable for their size and elaborated inscriptions. The fragments are noteworthy for their complex construction which integrates different techniques and materials in ornate compositions. Now that the significance of these objects has been recognised, there is a desideratum in scholarship to study this material.

To fully assess the extensive information contained in these cloths, it is important to apply interdisciplinary methods. Our research integrates detailed technical analysis with objective testing methods. These include dyestuff analysis with UHPLC-PDA, fibre analysis with TLM, SEM-EDX and radiocarbon dating. In addition, we have conducted reconstruction experiments to study particular production attributes. One area of interest pertains to dye techniques to achieve strong dark colours. Analysis and documentation of embroidery stitches provides an aid to recover damaged text. Our team of international scholars includes a Coptologist to study the unique palaeography of these written inscriptions to interpret their form, content and cultural context.

By applying interdisciplinary methods, we have sought to interrogate all observable attributes. Our data have resulted in interesting findings, but have also created a number of questions which have stimulated new perspectives. The goal of our interdisciplinary research is to develop a comprehensive understanding of Christian 'tiraz' in a form accessible to broader scholarship.

- 11 HORIZONTAL VS VERTICAL LOOM = TRADITION VS INNOVATION? THE CASE OF KOUKONISI SETTLEMENT (LEMNOS ISLAND) IN THE NORTH EASTERN AEGEAN**
Author(s): Boloti, Tina (General Secretariat for Research and Technology - Hellenic Ministry of Education, Research and Religious Affairs)
Presentation Format: Oral
- The prehistoric settlement on Koukonisi, an elliptical (c. 500 m x 400 m) low (max. ht. 10.6 m) islet located in the innermost part of Moudros bay on Lemnos, was excavated under the direction of Chr. Boulotis and the auspices of the Academy of Athens from 1994 to 2016 with intermissions. The densely occupied Bronze Age settlement excavated in the north part of the islet, provides an undisturbed sequence from the Early Bronze Age to the early Late Bronze Age, with sporadic finds of the early Mycenaean period (LH II-LH III A1) and a substantial phase of occupation corresponding to the developed Late Bronze Age (LH III A2 - LH III B periods). Given the fact that the loom weights begin to appear in the advanced or the close of Middle Bronze Age, I aim at discussing the introduction of the vertical loom in the settlement, an innovation which becomes more striking when evidence from earlier habitation levels is considered; the latter indicate the use of another type of loom, in all probability the horizontal one. Since the vast majority of the loom weights brought to light, circa 40 so far, belong to the prominent South Aegean, and particularly Cretan, type of loom-weights, with one (and rarely two) suspension holes and a peripheral groove on the top, they are considered as one of the hallmarks (along with conical cups) of Minoan influence throughout the Aegean at the time, reflecting probably an increased specialization in the textile industry.
- 12 WEAVING TRADITIONS IN ARCHAIC SICILY: THE CASE STUDY OF PORTELLA SANT'ANNA**
Author(s): Longhitano, Gabriella (University of Liverpool)
Presentation Format: Oral
- This paper will present the case study of Portella Sant'Anna, an area located to the north of the Acropolis of the archaeological site of Monte Polizzo (7th -6th centuries BC) in Sicily. The site yielded a group of loom weights of different weights and sizes from a potential working loom.
- My analysis has attempted to understand if and how these loom weights might have worked in a loom set up. The evidence at the site is suggestive of a particular way to set up a loom with loom weights of different weights and sizes, which might imply the use of different yarn diameters or raw materials (i.e. animal and plant fibres) and/or different techniques for tying weights to the loom.
- Weaving traditions in Archaic Sicily have recently been studied and the focus has been the investigation of loom weight types and the extent to which contact with Greeks and Punics influenced the local weaving traditions. This paper offers the opportunity to extend the discussion to the methodological approach.
- 13 COMBS FOR WOOL OR COMBS FOR PLANT FIBRES? EXPERIMENTS WITH RECONSTRUCTED TOOLS**
Author(s): Karg, Sabine - Schoch, Chiara - Lehnhardt, Enrico (Free University of Berlin)
Presentation Format: Oral
- While studying literature about textiles tools we found out that combs are detected in many archaeological sites throughout time and space. The actual use of these combs is mostly linked to textile production, while the material that should be "combed" can differ. In most cases the tools are interpreted as wool combs, only in rare cases flax combs are mentioned. From the Roman period there are combs made of Iron from several excavations. These combs have two rows of teeth and are very large. The combs are called "flax-combs". We analysed the find circumstances and collected written, as well as iconographic sources about these tools. A summary of these studies will be presented in our lecture.
- In addition, we performed experiments with several artefacts like combs and brushes by using wool and flax plaits. In our lecture we are going to present the results of these experiments and discuss the definition of the terms "flax and wool comb".
- 14 CONTRIBUTION OF MULTISCALAR STUDIES TO THE DEFINITION OF THE PLACE OF TEXTILE CRAFTS DURING PROTOHISTORY**
Author(s): yann, lori (INRAP - National Institute for Preventive Archaeological Research; Université Charles de Gaulle)
Presentation Format: Oral
- This paper proposes to focus on several tools belonging to textile craftsmen in the Final Bronze Age and the Early Iron Age. These discoveries from a northern half of France are the subject of a multiscalar analysis. The analysis of the weaver's tools reconsiders the design, iconography and sometimes the function that these objects could have played. The universe thus revealed attests to the attraction that the weaving has represented in societies in the past, both in economic terms and through symbolic imagery. Combs, scales and spindle whorls, but also ornaments (fibulae or pins) or ceramics will be used as examples to illustrate this point. This work aims to clarify a reflection at the level of society, by focusing on the status of the users of these objects. In this way, we will seek to give meaning to the use of religious iconography. Rather than typological and technological aspects, a point of view is preferred here that seeks to rediscover and interpret the ideas underlying the design of these objects and their link with weaving. The objective is to better understand this craft and creative field, as well as its place in protohistoric society. Ultimately, the results obtained from studies on textile production, which have recently adopted a more complex and multidis-

ciplinary approach, are perfect examples of protohistoric societies. They also make it possible to show that close stylistic connections exist between distant productions and also over time. This comparative approach allows us to formulate proposals on furniture to explain how a complex narrative system is adapted to the weavers' tools and to inventions that represent this craft.

15 **VISIBLE TOOLS, INVISIBLE CRAFT - AN ANALYSIS OF TEXTILE TOOLS ACROSS THE IRON AGE SOUTH COAST**

Author(s): Ferrero, Lewis (University of Cambridge)

Presentation Format: Oral

Identifying differences in textile production between Iron Age settlements and regions may provide an insight into craft production and organization, textile's possible role in trade and economy (Gleba et al. 2013), as well as the degree of craft specialisation in the settlements and the population at large. In economic terms, splitting the stages of textile production between settlements (as suggested at Danebury) could be an effective way of controlling raw resources and their production into commodities of prestige value, display, or exchange (Champion et al. 1984: 207-209). It may be possible to discover if certain stages of textile production (i.e.: fibre preparation, spinning, etc.) were universal domestic activities by examining where textile tools are found, both in context of their original sites and the distribution of tool types between sites (DeRoche 1991: 24-25). Here I will present my data and analysis of the tools from Iron Age Cornwall, Devon, Dorset, Hampshire, West Essex, East Essex, and Kent. I will use tool dimensions and weights to compare tool manufacture between sites (as well as possible effects these had on the textile they produced) and mapping tool locations to determine potential craft organisation.

16 **COMBING THE DATA: ASSESSING THE UTILITY OF 'WEAVING' COMBS IN THE TEXTILE PRODUCTION SEQUENCE DURING THE BRITISH IRON AGE**

Author(s): Beamer, Jennifer (University of Leicester)

Presentation Format: Oral

During the Glastonbury excavations in the early 20th century, Bulleid and Gray associated long-handled combs with weaving. Since then, the long-handled comb has been generally included as part of the weaving chaîne opératoire. The first attempt to understand the wear patterns on these combs occurred in 1871, however, it was not until the 1970s and 1980s that wear patterns were reassessed. Building on the collections of others, Tuohy's (1999) published PhD thesis further examined wear patterns and proposed that they were primarily used for band weaving.

The frequent association of weaving combs with other known textile production tools has embedded their place in the prehistoric textile toolkit for Britain. Although this association is generally agreed upon, their utility within the textile production sequence illustrates a vague understanding in context. Typically, they are depicted most often in association with the warp-weighted loom, despite Tuohy's proposition to the contrary. On the grounds of ethnographic analysis in conjunction with Tuohy's wear analysis, this paper proposes an alternate way of viewing these combs.

Tuohy, T. (1999) Prehistoric combs of antler and bone. *British Archaeological Reports*. Vol. 285.

17 **TEXTILE IMPRESSIONS FROM THE NEOLITHIC SETTLEMENTS IN NORTH MACEDONIA**

Author(s): Blazheska, Zlata (Independent Researcher)

Presentation Format: Oral

Due to the climate and the properties of the soil, prehistoric textiles are not preserved on the archeological sites in North Macedonia. Nevertheless, the existence of a textile industry during the Neolithic is testified by impressions of textiles in clay, as well as by the finds of spindle whorls, loom weights and needles.

This analysis of the prehistoric textiles is based on forty impressions on fragments of ceramic vessels from eight settlements in North Macedonia, dating from Early to the Late Neolithic. We identified the process of craftsmanship and the features of the textiles. Weave analysis and technological classification point to only one technique, the two-thread weft twining with simple S-twist and densely packed weft, producing a weft-faced fabric with no visible weft. The differences in the thickness of the loosely twisted weft threads and the weft/warp ratios influence to the appearance of the textiles. The finds of ceramic and stone loom weights indicate that some type of supported frame, perhaps a vertical warp-weighted loom was used for manufacturing those textiles, at least for the densely packed and evenly twined fabrics.

18 **TEXTILES AND SEALS: INVESTIGATING RELATIONS BETWEEN TEXTILE PRODUCTION AND SEALS AND SEALING PRACTICES IN BRONZE AGE GREECE USING STATISTICAL METHODS**

Author(s): Ulanowska, Agata (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

The 'Textiles and Seals' research project investigates the multiple and complex relationships between textile production, the iconography of seals and sealing practices in Bronze Age Greece. These relations can be traced today in the wide-ranging evidence, comprising textile imprints on the underside of and inside seal-impressed lumps of clay, seal-impressed textile tools (especially loom weights) and textile production-related motifs in the Aegean seals imagery. The main research questions that are posed by this project, aim to explain the use of textiles in sealing practices and the use of seals in the administration of textile production, as well as the meaning and diachronic frequency of references to textile production that appear in the iconography

of Aegean glyptic.

In order to facilitate the achievement of these tasks, an Open Access data base has been designed specifically for this project through the services of the Digital Humanities Laboratory of the University of Warsaw. In this paper, I will briefly demonstrate the structure of this data base and the possibilities of its search engine. Although the data entry has not yet been finished, this new comparative approach to investigate the relationships between different kinds of evidence, i.e. the imagery of seals, textile imprints and seal-impressed textile tools, has already proved to be a powerful tool. It offers new interpretations based on a large number of records and, until now, unexplored combinations of various data.

19 FROM USE WEAR TO USER: HOW LITERARY SOURCES CAN HELP UNDERSTAND GRAECO-ROMAN TEXTILE TOOLS

Author(s): Öhrman, Magdalena (University of Wales Trinity Saint David)

Presentation Format: Oral

Traces of use wear suggest long-time relationships between user and tool. For Graeco-Roman material, however, use wear analysis rarely permits conclusions on the identity or experience of those who handled specific tools. Attentive reading of textual sources, informed by archaeological and experimental investigations alongside the text's literary context, complement the picture.

Inscriptions on textile tools offer glimpses of how users related to the implements of their craft. Alberti (2018) highlights messages of practical information: some whorls at Vindolanda are inscribed with instructions e.g. on spin direction ensuring consistency in output. Other inscribed tools imply a joke shared between tool and user (e.g. the spindle whorl inscribed 'imple me, puella', Wild 1970: 33) and evoke an all-female usage context (cf. Beltran Lloris & Beltran Lloris 2012 on loomweights from Caesar Augusta). In bilingual, inscribed spindle whorls from Autun, tools express the user's identity (Mullen forthcoming). Yet in most contexts, it remains unclear who exercised controlled the inscribed messages: were they created for or by the user? Do they reflect or influence the attitudes of the tool user(s)? More extensive literary texts throw light on the emotional attachment between user and craft implements, and elucidate how entanglements between craftspeople and their tools were perceived by those around them. Tales of mythological craftswomen morphing bodily into their work evidence the close connection, blurring tool and user identity (Ov. Met. 4, 6; Symphos. 17), while other passages, focalised through the craftspeople, suggest a perception of their tools as a source of security both financial and emotional. The paper examines in detail Greek epigrams imitating dedications on textile tools, which detail the experience of their literary users, and a passage from Claudian which ties the weaver's tool and their personal and emotional attachments specifically together with traces left on the tools by the user's hands.

A. NUBIAN OPENWORKS. TRACKING A LOCAL TEXTILE TRADITION THROUGH THE AGES

Author(s): Yvanez, Elsa (University of Copenhagen) - Mokdad, Ulrikka (Centre for Textile Research, University of Copenhagen)

Presentation Format: Poster

Circa 2000-1500 BC, in today's Sudan, the Bronze Age people of Kerma knotted together long strands of linen threads to create lattice works of elaborate designs. Used as pot nets, these ancient piece of macramé received and hang vessels from the beams of tents and houses. 2000 years later, during the Meroitic period, similar looking lattice works decorated the bottom of cotton textiles intended to clothe members of the elite. These openwork borders concluded the weave of large fabrics woven on the warp-weighted loom.

In 1984 and 1998, the renowned Nubian textiles experts Elisabeth Crowfoot and Nettie Adams studied the openwork techniques developed at Kerma and at Qasr Ibrim during these two periods*. Highlighting their common decorative vocabulary, the authors proposed to see the two techniques as different manifestations of the same crafting tradition. Twenty years later, as part of the TexMeroe project, Elsa Yvanez and Ulrikka Mokdad reexamined this hypothesis using an interdisciplinary approach based on the meeting of textile studies with experimental archaeology.

This poster will present their detailed study as well as their intents to reconstruct original fabric structures. Bringing heads and hands together, the project provides the opportunity to reconstruct and understand the history and evolution of this remarkable technique.

*E. Crowfoot, "Openwork fringes from Qasr Ibrim", Meroitic Newsletter (MNL) 23, 1984, p. 10-16. ; N.K. Adams, "Ancient Lace of Nubia and the Sudan: a unique decorative tradition", Cahiers de Recherche de l'Institut de Papyrologie et d'Égyptologie de Lille (CRIPEL) 13/7, 1998, p. 17-24.

140 FURNISHED INTERIORS IN THE ANCIENT MEDITERRANEAN AND EGYPT

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Andrianou, Demi (National Hellenic Research Foundation, Athens) - Killen, Geoffrey (Independent researcher)

Format: Regular session

In the past few decades studies on domestic and funerary contexts have attracted scholars to delve into issues of interior space and daily life. Domestic architecture, space identification and gender areas are all subjects of current scholarship. However, one significant category of movable objects—furniture—has sadly been neglected. Despite the importance of these artifacts to modern discussions, the body of evidence is still very limited as most climates, apart from Egypt, are not conducive to

the preservation of wood and other fibres and thus the evidence has largely disappeared from the archaeological record. Notwithstanding this challenge, some new information has been added to the discussion on furniture since Gisela Richter's seminal 1966 iconographic study. This includes new data published in excavation reports (Delos, Olynthos, Thasos, Eretria and Halieis) as well as synthetic studies on the iconography and literary evidence. When studied in its primary context (domestic, funerary or sacred), furniture offers additional knowledge on daily life, funerary rites, space management, decoration and conspicuous consumption.

In the proposed session we aim to bring together scholars working on furniture in any of the three proposed areas:

- Furniture use from the Bronze Age to the Roman period in the Mediterranean region;
- The typology of Bronze Age to Roman-period furniture found in the Mediterranean region;
- The techniques and technological processes involved in furniture production within the proposed time frame.

We welcome synthetic studies as well as case studies on furnished interiors that give a better understanding of domestic, sacred or funerary interior space and human behavior based on physical, literary and visual evidence. Special categories of furniture (such as miniature furniture) would be a welcome addition.

ABSTRACTS

1 WHAT DID PHUGEGWRIS SEE? ASPECTS OF DOMESTIC FURNITURE IN THE LATE BRONZE AGE AEGEAN

Author(s): Boloti, Tina (General Secretariat for Research and Technology, Hellenic Ministry of Education, Research and Religious Affairs)

Presentation Format: Oral

In this paper I aim at examining aspects of domestic furniture in the Aegean Late Bronze Age. Starting with pertinent iconography, which provides relatively little evidence, I will focus on more or less contemporary texts, and especially on the 12 Linear B tablets of the series Ta from Pylos. This series, which offers the most interesting information on furniture of that era, specifically in a palatial context, constitutes a kind of inventory. It resulted from Phugegwrís' inspection of this kind of equipment on the occasion of the designation of Augeia (au-ke-wa) as da-mo-ko-ro (see PY Ta 711.1: o-wi-de pu2-ke-qi-ri o-te wa-na-ka te-ke au-ke-wa), and for which au-ke-wa would have been henceforth responsible. Apart from tripods and some other metal vessels, the main types of furniture recorded are tables (to-pe-za - cf. classical Greek τράπεζα), seats or thrones (to-no - θρόνος / θρόνος) and stools (ta-ra-nu-we - θράνυες cf. Homeric θρήνυες). Since all these objects belong to the treasure of the palace, the scribe is interested in describing their decoration in details, revealing, as a consequence, a major need for display and luxury. These pieces of evidence will be juxtaposed with archaeological finds, which not only certify the information of Linear B but also confirm the two decoration techniques used at Pylos, i.e. engraving and inlay.

2 FORMS AND FUNCTIONS OF MYCENAEAN FURNITURE

Author(s): Whittaker, Helene (University of Gothenburg)

Presentation Format: Oral

The most extensive evidence for the appearance and types of Mycenaean furniture, such as tables and chairs, can be found in wall-paintings which depict activities that take place in indoor spaces. Terracotta figurines of seated women provide further evidence for the types of chairs that were in use. The impression that we get from the iconographical evidence is that much furniture was easily moveable; for example, depictions of small tables and folding chairs suggest that they would have been stacked when not in use and that domestic space was to some extent changeable.

Although no examples of moveable furniture have been preserved, the remains of palaces and houses also provide evidence for fixed installations such as hearths, benches, and thrones.

In this paper I present an overview of the actual evidence for Mycenaean furniture. I also discuss what the remains of houses can tell us about the organisation of domestic space, the movements of people within the house, and how a "typical" Mycenaean house might have been furnished.

3 THE IDAEAN CAVE IN CRETE: AN IVORY CARVING WORKSHOP

Author(s): Muñoz Sogas, Judith (Universitat Pompeu Fabra)

Presentation Format: Oral

Around a hundred ivories of lions, sphinxes, papyrus, gazelles and bulls were discovered in the Idaean Cave, central Crete (Greece), dating to the 9th century. They are compared to Nimrud ivories from the Loftus group and similar ones have also been found at the Sanctuary of Artemis Orthia at Sparta. Some scholars think these might be imported from North Syria or Palestine, such as Sakellarakis, but others suggest the ivory was carved in the cave.

Most of the ivory objects from the Idaean Cave would have adorned furniture, probably wooden thrones, as their screw-like shapes and nail holes suggest. Therefore, this would have implied the presence of ivory carvers at the same site for later assembly of the wooden furniture. According to ancient sources like Philostratus, these carvers travelled to where the patron was, in this case, Crete, to produce their work instead of selling ready-made objects (Philostratus, *Vita Apollonii*, 5.20). Hence, Near Eastern ivory carvers worked in situ.

These ivories resemble the ones from Sparta, which date to later centuries. It is thought, therefore, that these ivory carvers of Near Eastern origin that worked in Crete could have also settled in Sparta during the 7th century BC and been active there until the 6th.

This phenomenon can shed light not only to the techniques used in Late Iron Age to produce ivory and wooden furniture, but also to the relationships between patron and artisan, and even to the use of ancient sanctuaries not only as religious spaces but also as production centres.

4 ΠΟΡΦΥΡΕΟΣ: ASPECTS OF THE TRANSFORMATIVE ROLE OF BRIGHT COLOUR-HUES IN INTERIOR SPACE IN HOMER

Author(s): Saito, Yukiko (University of Liverpool; Kyoto Seika University)

Presentation Format: Oral

This paper aims to elucidate how colour, more precisely brightness of hue, influenced the ancients' lives, especially focusing on πορφύρεος in Homer. I employ a new research angle, colour-related exploration with cognitive reading, which characterizes my on-going project. Colour as perceived inside a dwelling is vitally important because the light or brightness of hue has a substantial effect on our daily life. So too in antiquity. Light itself connotes hope but can also be alarming, since light and darkness (i.e., light and its absence) are two sides of the same coin. Byzantine rulers, including Constantine VII, who was born in a resplendent purple marble bedchamber, were nicknamed Πορφυρογέννητος, "the Purple-born" (Jenson 1963: 116; Finlay 2014: 28). Πορφύρεος, usually rendered as 'purple,' is a controversial term but doubtlessly functioned as a highly-regarded indicator in ancient society, as in the case of Tyrian purple (St. Clair, 2016: 159-64). Achilles has his guests sit on couches and purple rugs (τάπησίν τε πορφυρέοισιν; Il. 9. 200). Purple robes are used to cover Hektor's dead body (πορφυρέοις πέπλοισι; Il. 24. 796). Splendid purple coverlets adorn the backs of chairs (ρήγεια ... / πορφύρεα; Od. 10. 352-3). Targeting ταπήσ and ῥήγος ('carpet,' 'rug,' etc) along with πορφύρεος in this paper, I examine how they are associated with each other, while investigating πορφύρεος' metaphorical, transformed representation, then discuss the fundamental effect upon the context that purple or its radiant colour-hue implies, including references to the technical process used to produce πορφύρεος (Sterman (2012); Sassi (2017) etc). My final goal is to unveil the poet's aesthetic skill in composing his story, arranging bright purple hues within interior space, conveying not only a dazzling visual effect but also the deeply sacred nature of πορφύρεος, then to unfold the part of the realisation of ancient colour-sense.

5 REPRESENTATIONS OF ANCIENT GREEK BEDS/KLINAI IN VASE-PAINTINGS

Author(s): Liveri, Angeliki (Independent Researcher)

Presentation Format: Oral

This paper will present ancient Greek beds/klinai depicted on vase-paintings. Shape, decoration and use of this furniture will be studied focusing in selected representations on Corinthian and Attic vessels from the Archaic to the Classical times (6th - 4th c. BC). Bedclothes and pillows are also included to complete the bed-image. Sometimes footstools are displayed in front of the bed to reach it easily and also small tables for the placement of the dishes. One or two persons are reclining or sitting on a kline and more klinai are placed in the same room (andron) for a symposion. Depictions of klinai appear in a variety of themes. Similar scenes in paintings from other locations, e.g. from the Greek colonies in South Italy and Sicily will be also mentioned as comparative material showing similarities and differences. References in written sources (Homer, Plato a.o.) will be compared and combined with archaeological finds.

Aim of this paper is to classify the beds-representations according to the context in which they appear: such as in symposia in erotic scenes, in simple daily scenes at home, such as sitting, relaxing or sleeping; in nuptial, but also in funeral rituals; in mythological, religious or theatrical scenes. A classification according to the bed-design will also follow. It is also interesting to examine: a) whether the bed-representations correspond with excavated finds or they used by the vase-painters only as a painting motif representing fantastic or abbreviated versions of the real furniture; b) which vessels-forms are decorated by the above mentioned scenes including beds.

6 MINIATURE FURNITURE OF A CHILD'S GRAVE FROM ERETRIA

Author(s): Hasselin Rous, Isabelle (Musée du Louvre)

Presentation Format: Oral

In 1892, the Louvre acquired the offerings of a child's grave discovered in one of Eretria's necropolises (on the island of Euboea in central Greece). These offerings include more than fifty objects of different types and of various materials (bronze, silver, lead, wood, glass, bone, terracotta) in good state of preservation. The rarity of such a funerary deposit, consisting of miniature furniture and tableware, toiletries and daily objects, alimentary and monetary deposits, toys, as well as jewellery and terracotta figurines, suggests that the child belonged to a rich Eretrian family. The study of this funerary material and the numismatic evidence allows us to deduce that the burial was meant for a young girl, who died during the first decades of the Hellenistic period. The existence of five furniture forms in this tomb show the exceptional testimony of Eretrian funerary rituals of this period and the importance of these near the dead girl to reconstruct the context of the house.

- 7 CRITICAL DETAILS: EXAMINING ELEMENTS ON THRONES AND KLINAE FROM NORTHERN GREEK TOMBS. ASPECTS OF FURNITURE TECHNOLOGY OF THE GREEKS**
Author(s): Stamatopoulou, Vasiliki (The Greek Ministry of Culture, Ephorate of Antiquities of Thessaloniki City; The Hellenic Open University; The Aristotle University of Thessaloniki Excavation at Vergina)
Presentation Format: Oral
- Critical details: Examining elements on thrones and klinae from northern Greek tombs. Aspects of furniture technology of the Greeks.
- The paper focuses on funerary furniture found in early Hellenistic cist or chamber tombs in Northern Greece. Macedonia was reputed for its abundant and top quality timber, but due to the lack of preserved wooden furniture, the furniture technology of this area and of this era has not been studied. However, funerary furniture made of marble and stuccoed limestone replicate wooden furniture of their time, as known to us mainly from the art and from their preserved decorative elements made of various materials (gold, silver, ivory, and glass). Study of their details leads to conclusions about manufactural aspects of their wooden models and to the interpretation of typical morphological features, which have remained consistent over centuries. The high level of manufacture is noted ensuring that these funerary items of furniture reflect wooden ones that were of the highest quality of their time.
- 8 FURNITURE IN THRACIAN FUNERARY CONTEXT: AN INTEGRATED ANALYSIS OF MATERIAL, VISUAL AND LITERARY EVIDENCE**
Author(s): Stoyanova, Daniela (Sofia University) - Mannelta, Consuelo (Aarhus university)
Presentation Format: Oral
- While recent international publications have shed new light on the study of Macedonian and Anatolian furniture in funerary contexts (e.g. Andrianou 2009; Baughan 2013), new discoveries and studies in present-day Bulgaria make a first classification of Thracian funerary furniture possible. Our paper focuses on furniture elements, which are displayed within chamber tombs in earthen-burial mounds (e.g. Filipovo Tomb, Plovdiv; Tomb in the Griffins Tumulus, Shipka; Tomb at Dolno Izvorovo, Tomb in Ostrusha Tumulus, Shipka). They include funerary couches (klinai), tables, four-leg stools (diphroi), thrones, and foot-stools. Questions related to typology, decoration, and production will be explored which will also provide new data to assess the chronology of these items themselves, and of the tombs more generally. Further insights into Thracian furniture in the early Hellenistic period offer, in addition, the analysis of furniture elements and their textile textures which are vividly sketched on the tombs' wall painting decoration (e.g. the Kazanluk tomb), as well as their description in literary sources.
- 9 FURNITURE DISPLAY IN HELLENISTIC AND EARLY ROMAN BANQUET RELIEFS**
Author(s): Andrianou, Demi (National Hellenic Research Foundation)
Presentation Format: Oral
- The iconography of reliefs depicting banquets provides a great body of evidence for furnished interiors in the Hellenistic period, making up for their absence in the archaeological record. These reliefs (funerary or votive) present a standard iconography: one or more males recline on a couch while one or two females sit on separate chairs on either side of the kline. In front of the kline, a table is usually laden with food. The scene is often interspersed with exceptional furniture pieces, such as klylikeia. Banquet reliefs thus demonstrate furniture styles and modes of entertainment between the third century BC and the first century AD.
- A variety of furniture, often decorated with textiles, appear in banquet reliefs from the eastern Mediterranean (Asia Minor, southern Thrace and the East Aegean islands). Their deliberate selection and placement within the relief displays wealth and, consequently, status. Furniture becomes a visual indicator of wellbeing. Moreover the detailed depiction of furniture on reliefs engaged the viewer in "active viewing"; as we know from textual evidence, people looked at art and discussed it amongst themselves.
- Since funerary banquet reliefs extend beyond the Hellenistic era, the depiction of contemporary furniture pieces on them is also an indicator of robust societies. Already in first-century BC Samos, the once vivid and detailed depictions of furniture become schematic objects in the background, conceding their place to the human figures. This observed shift on Samos is tightly connected to social changes noted in Samian civic centers brought about by the First Mithridatic War and the plundering of the island by pirates (84 BC) and by Licinius Verres (80 BC).
- 10 INTER CATHEDRAS - WOMEN'S ARMCHAIRS AS STATUS SYMBOLS IN ROMAN HOUSES**
Author(s): Berg, Ria (University of Tampere; University of Helsinki)
Presentation Format: Oral
- In this paper I intend to analyse iconographic, material, architectonic and literary evidence about the significance of women's armchairs, cathedrae, in Roman households of Republican and Imperial Age. Such prestigious chairs, with a high backrest, armrests and often provided with a low footstool, can be seen in numerous images of Roman women, in particular dominae of households, surrounded by grooming servants. From literary sources we know that also other activities, such as receiving guests or sending out correspondence, could take place on such a female "throne". It is therefore obvious that besides being functional pieces of furniture, such seats were also status symbols signalling social and family identity. A specific question that will be asked in the present study is, where would such a seats be placed in Roman houses, in particular analysing a number of Pompeian

houses as examples. In literary sources, the words *essorium* and *sediculum* appear as nominatives of female spaces, having an obvious connection with the female chair. The paper will propose possible locations for such female spaces in ancient houses.

11 A TALK AND PRACTICAL DEMONSTRATION OF ANCIENT WOODWORKING TOOLS AND THE TYPES OF TOOL MARK LEFT ON ANCIENT TIMBER

Author(s): Killen, Geoffrey (Independent researcher)

Presentation Format: Oral

This presentation and demonstration will examine the development of metal woodwork tools and measuring equipment used in the ancient world. From ancient Egypt we have evidence of the wide range of tools and technologies available to the ancient carpenter to furnish homes within urban settlements. Various social mechanisms were employed to source furniture and the carpenter was pivotal to the success of a settlement. The carpenter's role was to create many of the products that made life in an ancient Egyptian home "comfortable" or at least "tolerable". He also helped create the fabric of houses as well as the looms and ancillary equipment needed for home weaving. He manufactured furniture including cosmetic boxes and even had time to make simple toys and games that Egyptians used to occupy their "leisure" time. The demonstration involves a range of copper and bronze tools to work timber and looks at the types of tool marks these ancient tools leave on the surface of the wood. The wood-working tools discussed and evaluated will include the mortise and firmer chisel, mallet, awl, hand adze, hand saw and bowdrill.

142 SO CLOSE, NO MATTER HOW FAR? SKETCHING THE RELATIONSHIP BETWEEN WATER- AND LANDSCAPES ACROSS EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Huber, Renata (Amt für Denkmalpflege und Archäologie Zug) - Gross, Eda (University of Basel, Integrative Prehistory and Archeological Science - IPAS; Amt für Denkmalpflege und Archäologie Zug) - Dolbunova, Ekaterina (The State Hermitage Museum, The Department of Archaeology of Eastern Europe and Siberia; The British Museum) - Giagkoulis, Tryfon (University of Bern, Institut für Archäologische Wissenschaften - IAW) - Naumov, Goce (Center for Prehistoric Research / Museum of Macedonia)

Format: Regular session

165 years after the discovery of pile dwellings in Switzerland, this meeting in Bern should be an occasion to relate archaeological waterscapes to their surrounding landscapes. Due to their inherent fluidity and their impact on cultural phenomena, waterscapes are destined to make us look beyond rigid paradigms, dichotomies, and categories, in order to dissolve them and merge the results into something new.

Relating and integrating the various aspects of life in waterscapes and landscapes, as well as their transitional areas, creates new and unexpected narratives. Archaeological remains in waterscapes, (in or at lakes and sea, in peatlands, bogs etc.) must be seen in their relationship to and their symbiosis with water. The traditional territorial models, which saw dwellings or infrastructure sites as simply located by the water, limited the field of vision.

In order to understand waterscapes, the microarchaeological frog's eye perspective, which examines the local aquatic environment, must be supplemented with a broader perspective, for water does not separate – it connects. Thus, archaeological sites must be viewed in relation to the water- and landscapes around them, in relation to each other, and as part of a wide and far-reaching network of similar relationships.

There is a wide variety of methods (e.g. from the field of landscape archaeology or network analysis) to investigate the relationships between terrestrial and aquatic areas and the transitional fields between them as well as the "amphibious" networks created by them. These networks are the result of a lively, diverse and constantly changing interplay between different actors (humans, animals, plants and other matters), factors, and forces. The focus of this session is on this interplay between water and land as well as its specific taphonomical, ecological, economical, climatic and cultural factors (which may result in pollution or overexploitation) regardless of restricting time or space frames.

ABSTRACTS

1 LAND AND SEA TERRITORIALITY IN THE DANISH LATE MESOLITHIC

Author(s): Grøn, Ole (Dept. of Geosciences and Natural Resource Management, Univ. of Copenhagen)

Presentation Format: Oral

For the Danish Late Mesolithic, it is well known that highly productive sea areas played an important role for the subsistence together with a number of land resources. However, there has been little focus on, how such land-sea territories were organized spatially. An analysis of the available data demonstrates a reality that differs from the general assumption, that the settlements to a high degree were concentrated at the mouths of inlets, fjords and rivers. Settlements appear all the way around such inlets, also at their heads. Surprisingly enough, however, the known Late Mesolithic graves show a clear tendency to concentrate at their mouths. On the basis of these data in combination with ethnoarchaeological information about territoriality and the placing of graves in the landscape, this situation is interpreted. It is suggested that the Late Mesolithic territoriality had a specific and repeated pattern for the integration of sea and land areas.

2 THE ROLE OF WETLANDS AS A PLACE OF CONTACT WITH THE SPIRITUAL WORLD

Author(s): Larsson, Lars (Department of Archaeology and Ancient History)

Presentation Format: Oral

Recent discourse on the relationship between society and the world-view of its members has shown that interpretation should not be attempted solely through consideration of artificial constructions; it also needs to involve the natural landscapes

The role of wetlands as a place of contact with the spiritual world was clearly important during the Neolithic of Southern Scandinavia. In order to obtain a more detailed and hopefully more holistic understanding of votive deposition in Neolithic society, an area in the southernmost part of Sweden was chosen for further study. The area contains a complex range of landscape features, the understanding of which is fundamental to the analysis of wetland depositions. The landscape is mainly undulating and the wetlands are usually rather small in size. Field survey along with information gained from several farm collections means that the find locations of a considerable number of archaeological deposits are now known. From the perspective of the Neolithic period, almost every wetland was used for some form of votive deposition. In certain respects, the cosmology related to wetland offerings was active throughout most of the Neolithic, and also in later periods. Some wetlands appear to have been imbued with ideas of a sacred character over many centuries, and in some cases millennia. Votive depositions within the hummocky landscape are usually rather small-scale, with the more substantial depositions being found in the larger wetlands on the plain. This might indicate that wetlands in different kinds of landscapes could have special importance in the metaphysical world.

3 STILL POINTS IN A MOVING WORLD: AN ARCHAEOLOGY OF THE NON-VISUAL CULTURAL MARKER

Author(s): Stevens, Fay (University of Notre Dame in England)

Presentation Format: Oral

This paper focuses its attention on the deposition of Bronze Age metalwork in watery contexts of south west Britain, UK. It will present the data of material evidence of Bronze Age metalwork, classified as 'stray finds', and consider patterns of depositional practice in a variety of watery contexts. It will also take a closer look at definitions and qualities of water and consider an interplay between the materiality of metal and its relationship to specific water types. This will lead to a deeper discussion on phenomenological fieldwork methodologies and how we might approach a study of findspots and waterscapes. These still points in the moving worlds of the Bronze Age offer a great insight into cultural acts of deposition and the construction of liquidscaapes. This evidence has much to offer in our understanding of the Bronze Age and this paper will present a proposition for an archaeological engagement with water/liquidscaapes of non-visual social action.

4 A SURROUNDED SEA: THE IRISH SEA AS LANDSCAPE OR SEASCAPE DURING THE MEDIEVAL PERIOD

Author(s): Johnson, Andrew (Manx National Heritage)

Presentation Format: Oral

The Isle of Man lies close to the centre of the Irish Sea, surrounded by what is now Ireland, Scotland, England and Wales. The earlier medieval religious landscape of the island is characterised by small chapels, burial grounds and associated monuments, particularly carved stone crosses. About 170 chapels and more than 200 crosses are known, within an island of just 580km².

Previous research has tended to focus on the distribution of these monuments within the island's landscape, but little attention has been paid to the relationship of those sites lying on the coast or those with views to neighbouring landmasses.

The application of map-regression and landscape survey is beginning to make sense of the factors governing the siting of these monuments, their perspective when viewed from the sea, and the links they potentially create across an enclosed seascape. This offers new ways of appreciating the Irish Sea as an 'inland' sea, and the opportunities it presented for travel, communications, trade and pilgrimage during the medieval period.

5 CONNECTED BY WATER, NO MATTER HOW FAR. WATER-BOUND RELATIONSHIP BETWEEN VIKING CHIEFTAIN SEATS AROUND THE TRONDHEIMSFJORD, NORWAY

Author(s): Maixner, Birgit (Norwegian University of Science and Technology)

Presentation Format: Oral

Like the Mediterranean Sea in miniature, the Trondheimsfjord is situated in central Norway, widening from a narrow inlet to a width of 13 km and stretching 130 km into the inland, structured by branches, islands and estuaries. Touching at a right angle the seaborne trading route along the coastline of Atlantic Norway, the inlet is also connected to central Sweden by large east-west going valleys, thus constituting an important junction for long-distance traffic. The lowlands south and east of the fjord are among the best agricultural areas in Norway. Centrally in the fjord and easily accessible by water from all directions, the superior court site Frostatinget was situated on the Frosta-peninsula. Scattered around the fjord, at estuaries and in the agricultural areas, chieftain seats from the Viking Age are documented by archaeological and written sources. Depending on their position as well as the size and quality of their hinterland, their access to infield and outfield resources was different, as well as access to communication networks. Separated from each other by wooded areas and highlands, these settlement chambers were hardly connected by overland routes. On the contrary they were closely connected by water, supported by the advanced ship-building technology of the Viking Age which offered excellent conditions for water-bound traffic. The medieval Icelandic sources refer to a number of powerful and well communicating Viking chieftains in the areas within the Trondheimsfjord. Strong chieftain seats,

monumental grave mounds, cult centers and a hierarchic system of court sites indicate that the Trondheimsfjord was a region of complex social and economic development in the Late Nordic Iron Age. The paper aims to examine the impact of different factors on the relationship and network among the Viking chieftain seats around the fjord and their relationship to external networks.

6 HUMAN-ENVIRONMENTAL INTERACTIONS IN NEOLITHIC LACUSTRINE LANDSCAPES: MULTI-DISCIPLINARY RESEARCH OF THE SERTEYA II SITE (W RUSSIA)

Author(s): Dolbunova, Ekaterina (The State Hermitage Museum; The British Museum) - Mazurkevich, Andrey (The State Hermitage Museum) - Kittel, Piotr (Lodz University) - Maigrot, Yolaine (UMR 8215 Trajectoires, CNRS) - Kazakov, Eduard (Nansen centre) - Gauthier, Emilie (Univ. Bourgogne Franche-Comté) - Wieckowska-Lüth, Magda (Christian-Albrechts-Universität zu Kiel) - Danger, Maxime (University Paris 1 Panthéon-Sorbonne) - Bernard, Vincent (UMR 6566 du CNRS)

Presentation Format: Oral

The lacustrine landscape within the contemporary Serteyka River valley (a tributary of the Western Dvina) was formed after the recession of the Weichselian (Valdai) Ice Sheet. It was earlier occupied by a few lake basins, which shores were settled from the 8th mill BC. In order to reconstruct human-environmental relationships and the history of local environmental changes, multi-disciplinary researches were conducted on the Serteya II site.

The Mesolithic and Neolithic cultural layers dated from the 8th to 3rd mill BC were found within lacustrine deposits – mostly coarse-detritus gyttja. Mesolithic and Neolithic settlements functioned here during regression phases of the palaeolakes. The archaeological context suggests the presence of short-term episodes of lake regressions (ex. ca. 4400-4200 BP), allowing the pile-dwelling settlement's development on a post-lake plain. The wooden constructions were situated on the shore of a deep-water post-lake basin, with a remote household zone documented within coarse detritus gyttja layer. Gyttja is underlain by silty-sandy deposits with redeposited Early Neolithic (7-6th mill BC) potsherds. It demonstrates intense transgression in the Mid-Holocene. Also finds dated to the 5th-4th mill BC bearing traces of steppe cultures' influence have been recently revealed. Bones of three human skeletons dated to the first half of the 3rd mill BC, were found deposited at the surface formed by lacustrine sediments and covered with trees' branches. Rich ecofacts found at the site document exploitation of diverse landscapes, mostly lacustrine as well as river, forests, forested wet areas and glaciofluvial or morainic uplands.

Through the millennia, the region attracted bearers of different cultural traditions through established networks or as terra incognita with rich natural resources of lacustrine landscapes located in the proximity of the Western Dvina River. It was highly influenced by transgression-regression stages; local environmental changes were triggered both by natural and anthropogenic factors.

7 EVERYTHING ELSE MATTERS: RECONSIDERING THE LACUSTRINE SOCIETIES IN THE PREHISTORIC BALKANS

Author(s): Naumov, Goce (Center for Prehistoric Research / Museum of Macedonia)

Presentation Format: Oral

Wetland archaeology put emphasis on the waterscapes and the societies that dwelled and interacted with such environment. This approach provided very detailed insight into the life of prehistoric communities inhabiting the lakes and marshes i.e. the natural setting that enabled good preservation of organic material, such as buildings, tools, effigies, baskets, clothes etc. The abundance of this material opened new perspectives of archaeological research and integrated more the science in setting the thorough answers on how people lived in the past and when in particular the chronological events had happen. But on the other hand, this fertile scientific milieu of wetland archaeology disregarded what was going on in the neighboring dryland areas and sort of isolated the lacustrine and marshland societies from the potential interface they had with people living in different environment.

Therefore a refocus of wetland archaeology is necessary, first on reconsideration of landscapes that were once marshes or shallow lakes and recently were modified into drylands, and second, the reassessment of networks lacustrine societies had with communities living far from them or in a nowadays altered environment. Such reevaluation has been applied recently to Neolithic societies in the Balkans that exposed a dynamic networking of distant societies living on lakeshores and valleys behind high mountains, but also indicated different landscape from the one we can observe today. Therefore this paper will aim to employ the same approach and consider the lacustrine societies and those in distant valleys in Chalcolithic, Bronze and Iron Age in the Balkans. Current data indicates much more lively interaction in these final stages of prehistory even among communities living thousand kilometers away and in the different environmental settings.

8 THE PREHISTORIC WETLAND SITES OF OHRID AND PRESPIA LAKE

Author(s): Todoroska, Valentina (NU. Museum dr Nikola Nezlobinski Struga)

Presentation Format: Oral

The focus of this presentation is on the prehistoric wetland sites near Lake Ohrid and Lake Prespa in the Republic of Macedonia. As part of the Ohrid, Prespa and Korca valleys, this region represents a significant geographic part of the southwestern Balkans.

The intensive and extensive surveys, as well as the results from the recent excavations in this region, have identified pile dwelling settlements on the shores of Lake Ohrid and Lake Prespa and underwater.

In addition to the results from the surveys and the excavations, the presentation addresses the archaeological material and the movable finds, such as harpoons, axes, pottery and loom weights, as well as some similarities and differences in their material, shapes and use. All these findings will allow us connect all regional sites and use them for joint research.

These sites date from the Neolithic to the Iron Age, so one of the aims of this presentation is to understand past human behavior and environmental dynamics in the region.

9 DOES IT REALLY MATTER? ASPECTS OF SPATIAL ORGANIZATION OF THE PREHISTORIC SETTLEMENTS IN AMINDEON BASIN (WESTERN MACEDONIA, GREECE)

Author(s): Giagkoulis, Tryfon (Institute of Archaeological Sciences, University of Bern)

Presentation Format: Oral

The fragmentary view of the prehistoric habitation in Amindeon Basin has changed rapidly the last few years due to the preventive archaeological work of Florina Ephorate of Antiquities (Greek Ministry of Culture and Sports), imposed by the intensified mining activities at Amindeon Lignite Mining Zone. The Rescue Excavations Project was initially focused on the survey and trial trenching of an area of approximately 550 hectares, an endeavor that resulted the discovery of 54 new archaeological sites dating from prehistoric times to late antiquity.

The dominant presence of the basin's four lakes constituted one distinctive natural setting, in which the Neolithic and Bronze Age inhabitants performed their socioeconomic and ideological activities. However, beyond the "strategic" decision of the local communities to operate diachronically in a wetland environment, the specific locations chosen for the establishment of the occupations show recordable diversity in respect to their spatial relationship to water. Consequently, the shift of structures, people, livestock and activities from water- to landscapes and vice versa necessitates some focused reconsideration of the characterizations "lakeshore", "lakeside" or "dry-land" which are frequently used to describe the prehistoric settlements discovered in Amindeon Basin.

In order to approach this issue, some of the results emerged from the rescue excavations of the prehistoric settlements Anarghiri IXa, IXb and XI will be presented. The information regarding their location at the surroundings of Lake Chimaditis, their spatial proximity, dating and diachronic development form the general framework for their first-level integration into the local environmental and sociocultural context. Moreover, the architectural remains and especially the accessing and enclosing works unearthed at the periphery of the settlements offer - due to their size, structural attributes and spatial arrangement - intriguing evidence regarding the spatiotemporal interactions of the local prehistoric communities in the fluid water- and landscapes of Amindeon Basin.

10 THE RELATIONSHIP BETWEEN WATERSCAPES AND NURAGIC COMMUNITIES IN PROTOHISTORIC SARDINIA

Author(s): Pisanu, Laura (University of Cagliari) - Hitchcock, Louise (University of Melbourne) - Cicilloni, Riccardo (University of Cagliari)

Presentation Format: Oral

This paper investigates the role of waterscapes as unifying elements in the cultural and economic relationships between the sites of Sinis and Montiferru in Western Sardinia. The Banatou site, whose oldest habitation dates to the Late Bronze age (X-IX B. C.), is near the stream of Riu Maistu Impera which rises in Montiferru and flows into the Cabras lagoon. Sinis' wetlands formation and maintenance depends in part on Montiferru's watershed. We suggest that the Rio Maistu Impera could be the link to understanding the purpose of the Nuragic cultures around the Late Bronze Age village and funerary areas at Banatou and the famous funerary site at Monte Prama characterized by Nuragic statues. This paper will seek to better clarify the nature of the link between these sites through an analysis of the waterscapes and architectural evidence that connect them.

Known for the unique similarity to Monte Prama's statuary, Banatou may have been the site of burials of these heroic figures of the Early Iron Age, based on the coexistence of a sculpted element in the form of a limestone human head found along with a large number of limestone and sandstone slabs. The monumentalization of the funerary space wasn't new for the Montiferru Nuragic communities as seen to the north of Banatou, in the localities of Procus, Funtana Pira and Caratzu. There were discovered Neolithic rock carved tombs, dolmen, allées couvertes and seven giants' tombs built at distances between 100 and 200 metres apart. It will be argued that the proximity and waterscape connectivity of these built features created a monumental funerary landscape, without comparison in the Nuragic period (XVII-XII B. C.). After the Late Bronze Age this funerary area was no longer used and we suggest that its role might have been continued by the site at Banatou.

11 WATER MANAGEMENT AS A MARKER OF LANDSCAPE CHANGES IN MEDIEVAL SOCIETY. METHODOLOGY AND CASE STUDIES

Author(s): Giannini, Nicoletta (Università Roma Tor Vergata)

Presentation Format: Oral

The present paper aims at showing how the analysis of hydraulic infrastructure in relation to the urban or rural society managing it may constitute a relevant marker of landscape transformations, if combined with other archaeological markers. For this purpose three case studies with different dating and settlement patterns will be introduced: the city of Albano (Rome, Italy), one of the most ancient seats of diocese in Italy, which shows a close relationship between preexisting hydraulic infrastructure and the

new seats of religious power in the structure of the late antique and early medieval civitas, by defining a particular control system of the urban and rural landscapes in close connection; the hydraulic systems of the lakes of Albano and Nemi (Rome, Italy) where the study of their components in connection to manufacturing activities has demonstrated how the management and maintenance of the two systems becomes a fundamental element for a better understanding of rural landscape transformations during the entire medieval period; the case of the urban artificial stream of Marana (Rome), made by pope Callistus II in 1122 and part of an articulated project for the reorganization and city planning dateable to the beginning of the 12th century.

12 BRIDGE(S) OVER THE RIVER SEINE : CONNECTING LANDSCAPES IN THE SEINE VALLEY FRANCE

Author(s): Kovacic, Joseph (Eveha/Terrascope) - Collas, Rémi (Independent archaeologist)

Presentation Format: Oral

Connecting different parts of the landscape divided by water has always been a human occupation, with our present efforts little changed in form from those in the past – going around, going through, going on, and going over. While today monumental bridges often dominate the landscape, in European pre- and proto-history there are relatively few examples of bridges, much less monumental constructions. Recent developer-funded excavations at the site of Pont-sur-Seine in north-eastern France provide us with a new data that allows us to imagine that bridges were more common, and in some cases more monumental, than we thought.

Our work at the site identified five bridges, comprised of nearly 350 in situ posts, with construction and reconstruction dating between 215/213BC and 134/133 BC. These bridges also existed within an already occupied landscape, with a large neolithic settlements to the immediate north and east, and a bronze age habitat occupying a small island within the channel which the bridges cross, illustrating that this location in the wider landscape was well inscribed into the collective memory of the Iron Age bridge builders.

Crossing relatively long spans of up to 80m, and built to a height least 4 to 5m above the bed of the Seine, the bridges themselves were built and repaired according to a relatively standard model, while also taking into account the visible, invisible, occupied, and perhaps 'spiritual', nature of the Seine at this particular point in the landscape (an exceptional statue, likely of a woman and made from Yew, was recovered near the base of one of the bridges). It is also clear from our experience that the retrieval of this type of data is closely related to the excavation methodology, which comprises the mechanical stripping of large surfaces and the emptying of substantial sections of palaeo-channels.

13 DELTA STORIES: LIVING IN THE LORZE RIVER DELTA FROM THE LATE GLACIAL TO THE ANTHROPOCENE

Author(s): Jecker, David - Reinhard, Jochen (Amt für Denkmalpflege und Archäologie Zug) - Gross, Eda (University of Basel) - Huber, Renata - Schaeren, Gishan (Amt für Denkmalpflege und Archäologie Zug)

Presentation Format: Oral

In archaeology, environmental history all too often focused on the individual settlements and on the economic use of their immediate environment. This view fails to acknowledge the importance of other actors (e.g. animals, plants, waters) interacting with humans. Outside the settlements, the traces of humans and these other actors are entangled and become difficult to discern. This is especially true for processes in deltas, which are inherently dynamic, complex, short-lived and fragmented. The life and activities of humans in such areas can only be properly assessed if the habitat as a whole with all its actors is understood and a long-term perspective is adopted.

Due to intensive construction work in the Lorze Delta since the 1980s, the archaeological department of Canton Zug has carried out a number of excavations. However, only now has the basic information about the sites (e.g. location, sediments and dating) been more broadly compiled and the results of the different studies been collated. This has led to ground-breaking insights into the cultural and natural interactions in the catchment area of the Lorze River.

In the early stages of the Lorze Delta during the Late Glacial and Early Holocene, after the melting of the Reuss Glacier, the only just populated landscape was characterised by unstable geological conditions. When analysing Neolithic and Bronze Age pile dwellings, understanding the Lorze Delta's formation is a prerequisite for appreciating the sites' location. In the alluvial fan, long-term changes in human and riverine activity from the Bronze Age to the Middle Ages can be detected. Today, human impact instead of geological processes write the delta's story: the river course has been diverted to give way for a motorway while the delta itself has been altered artificially.

14 FROM LAKESHORE TO HILLTOP. A LANDSCAPE ARCHAEOLOGY APPROACH TO 4TH MIL. LAND USE IN THE ALPINE ATTERSEE-MONDSEE REGION

Author(s): Kowarik, Kerstin (Natural History Museum Vienna; University of Vienna) - Seidl da Fonseca, Helena (Kuratorium Pfahlbauten; University of Vienna) - Klammer, Julia - Maurer, Jakob - Taylor, Timothy (University of Vienna)

Presentation Format: Oral

Of Austria's nearly 30 waterlogged sites 22 are attributed to the 4th mil. Mondsee group. These sites lie scattered around the lakes Attersee and Mondsee at the periphery of the Northern Limestone Alps. Together with the cultural entities of Cortaillod and Pfyn, the Mondsee group counts among the earliest copper-using horizon north of the Alps. The rich material culture of these lacustrine sites indicates a complex socioeconomic structure and far-reaching transalpine contacts. Recent research, conducted within the framework of the trinational Beyond Lake Villages project, has targeted 4th mil. land use in this area by combining

palaeoenvironmental investigations with a landscape approach. Here we propose to present our landscape archaeology work in the Mondsee-Attersee region.

Firstly we investigated the lacustrine settlements on the shores of lakes Attersee and Mondsee by means of site catchment analysis on different surfaces of a high resolution terrain model. A broad variety of open source landscape data was included in the analysis. Based on this a predictive model for the shore areas of lakes Attersee and Mondsee was developed. Secondly we aimed at enhancing our understanding of the relationship between the lakeshore areas and the dryland zones in the hinterland of the lakes through the investigation of visual patterns, cost surface analysis and various other forms of landscape characterization. One of the most remarkable results of these analysis is the distinct character of 4th millenium "visibility patterns" compared to other time periods.

15 ELEMENTS OF AN AQUATIC CULTURAL LANDSCAPE

Author(s): Mainberger, Martin (Landesamt f. Denkmalpflege Baden-Wurttemberg)

Presentation Format: Oral

Underwater and wetland archaeology have made important contributions to the knowledge of the origins and development of "cultural landscapes". In spite of that the perspective to "landscape" has basically remained terrestrial. Scientific questions and ongoing debates focus mainly on land-based subsistence strategies like woodland management, land use or agricultural operation systems. This is in a certain contrast to the nature of waterlogged sources, which include a multitude of features illustrating the importance of water as a resource. Prehistoric research on "pile dwellings" all across Europe has yielded a large variety of impressive evidence from lake floors and bog sites, throwing a light to the close relation of humans and wet environments. With shorelines that changed permanently due to oscillating water tables and human activity, "landscape" expands beyond water-fronts. Modelling of geomorphological formations below today's water tables has revealed the same close relations of archaeological sites – especially settlements - to geological and hydrological features as on dry land. In the larger scale of landscape archaeology such "submerged landscapes" occur as elements of a cultural landscape that is composed of aquatic as well as of dry land features. The presentation identifies basic elements of aquatic cultural landscapes from a frog's eye perspective and at the example of archaeological landscapes of the South West German pre-alpine forelands.

A. A GLOCAL RE-EVALUATION OF POSSIBLE PLEISTOCENE SEA-CROSSINGS

Author(s): Zervoudakis, Panagiotis (Dpt. History-Archaeology, University of Crete)

Presentation Format: Poster

A growing corpus of finds dated to the Palaeolithic from islands in the Aegean has changed the archaeological community's perspective on the earliest occupation of oceanic islands and the capacity of pre-sapiens hominins to make successful sea crossings. Some scholars have chosen to relate these marine dispersals with ancestral species such as *Homo erectus* or *Homo heidelbergensis*. This data has been compared with evidence of Pleistocene seafaring from the Pacific Ocean, as well as proposed sea-crossings of the Atlantic Ocean. Although the correlation of local finds with global perspectives of the past can and has been fruitful in many cases, the marine-route hominin dispersals theory in the Mediterranean has not thus far been well documented based more on inference rather than direct evidence. The majority of scholars deem the existing evidence, mainly from the Aegean, insufficient to support systematic sea faring activities on the Mediterranean or a sustained hominin presence on the Greek islands. The suggestion that a non-modern species, such *Homo erectus*, had inhabited islands in the Aegean or the Pacific during the Lower Palaeolithic is difficult to prove on the existing corpus of evidence, however it may equally be difficult to disprove. The debate has led both sides to extreme views, ultimately offering little to the better understanding of human mobility and modern behaviour during the Pleistocene. An alternative approach to the idea of early seaward dispersals will be discussed, interpreting local data based on the concept of glocalisation.

144 TOWARDS A SPATIAL DATA INFRASTRUCTURE FOR ARCHAEOLOGY

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: McKeague, Peter (HES: Historic Environment Scotland) - Corns, Anthony (The Discovery Programme) - Moreau, Anne (INRAP: Institut National de Recherches Archéologiques Préventives)

Format: Regular session

Through the INSPIRE Directive (2007) public organisations across Europe are required to share environmentally-related spatial datasets to support decision making and management of the environment. As a result heritage agencies responsible for the designation and management of Protected Sites across Europe have released Web Map and Web Feature Services through the INSPIRE Geoportal.

In contrast to datasets mandated by INSPIRE, which are underpinned by consistent data standards, little consideration has been given to the wealth of spatial data created through archaeological fieldwork and research. Digital technologies now enable the high-precision recording of archaeological excavations and surveys, placing these activities in their wider landscape, whilst advances in remote sensing techniques combined with processing power allow recording to be undertaken over many hectares compared to the targeted, site-specific surveys of the early 21st century. Ground and Airborne Laser Scanning offer new opportunities for the recording and analysis of our past. This is data that ultimately informs our understanding and management of sites and archaeological landscapes, from informing the planning process to measuring the long-term impact of climate change.

Despite its potential, the data is largely inaccessible beyond illustrations fossilised and siloed within individual final published reports. The underlying primary data is difficult to find, access and reuse. The data structure not only differs across but also within organisations, hindering efficient reuse. Then there are questions of who should collate, manage and publish spatial datasets, as well as access rights.

The Amersfoort Agenda recognises the need to share, connect and provide access to archaeological information through digital technologies, with the aspiration to improve collaboration, yet examples of a collaborative approach to managing and publishing spatial data pooled from archaeological projects are rare. We welcome papers that discuss the challenges and solutions to finding, compiling and accessing spatial data across multiple projects.

ABSTRACTS

1 WHY WE NEED A SPATIAL DATA INFRASTRUCTURE FOR ARCHAEOLOGY

Author(s): McKeague, Peter (HES Historic Environment Scotland)

Presentation Format: Oral

Through the INSPIRE Directive (2007) public organisations across Europe are required to share environmentally-related spatial datasets to support decision making and management of the environment. As a result heritage agencies responsible for the designation and management of Protected Sites across Europe have released Web Map and Web Feature Services through the INSPIRE Geoportal.

However there is no requirement to collate, manage or share spatial data created through fieldwork. As a result there is often little or no consistency across data created from separate fieldwork projects and the data is not easily accessible or reusable beyond the lifespan of the project. At best the data, often only the project report, may be deposited as part of a project archive. However, too often the spatial data – site locations, geophysical survey grids, excavation trenches etc - is fossilised in the pages of the report severely constraining the ability to reuse and combine data from different projects. There is often little consistency in both the data structure attribution from different projects, hindering efficient reuse. For more specialist data, such as remote sensing datasets, the technical metadata required to assess the data quality is incomplete or in pdf format. Data rights may also inhibit reuse. Can the data be reused without infringing the Intellectual Property Rights and copyright of the depositor or third party data (such as background mapping). There are also questions of who should collate, manage and publish spatial datasets, functions outside the remit of traditional archives.

This paper will explore the challenges and opportunities presented by spatial data from archaeological projects. In proposing that we need to think beyond individual projects to make efficient use of the spatial data we create, we need to consider the potential value to be gained and benefits from managing spatial data more effectively.

2 ONLY WHAT IS KNOWN CAN BE PROTECTED

Author(s): Steigberger, Eva (Bundesdenkmalamt)

Presentation Format: Oral

Austria's Monuments Authority (BDA) is a federal institution with a statutory mandate to catalogue Austria's monuments. The Authority is working on georeferenced mapping of this inventory in context with Austria's offensive towards more digitalization. Austria's administrative procedure for example in process of monument protection includes a mandatory identification of objects via political community, cadastral community and lot. Exact identification is obligatory, as this is a procedure for each individual object. In order to comply with legal obligations on the basis of INSPIRE the Authority has to provide mapping of all objects – archaeological and other – accessible by the public via cooperation with State authorities enables for easy access to this geo data, that facilitates a simplification in administrative procedure. Casefiles are presented, that highlight the benefit for the Authority on the one hand and the public, for example land owner, developer or planning commissions as the data provided by the Authority create a better understanding and better knowledge on exact locations of archaeological monuments.

3 TRAVERSING MOUNTAINS, VALLEYS AND ARCHIVES - A DIGITAL INVENTORY OF THE ARCHAEOLOGICAL RECORD OF THE CANTON GRISONS, SWITZERLAND

Author(s): Mohr, Franziska - Sele, Raphael - Flück, Hannes (Archäologischer Dienst Graubünden)

Presentation Format: Oral

The Amersfoort Agenda encourages actors in archaeology from all over Europe to start sharing archaeological information. Yet to be able to share any data with new technologies, this data needs to exist digitally. For this critical first step, a case study is presented that discusses an approach enabling digital access to the archaeological data of the canton Grisons, Switzerland.

The archaeological service of Grisons has recently started to use digital documentation techniques on excavations. Thus, from the past couple of years there is a rich collection of spatial information that is joinable to an existing archaeological database. However, most records of the archaeological work – starting at the end of the 19th century – only exist in analogue form. To optimize planning processes and to stimulate research questions, it is crucial to allow digital access to basic information of all known 3500 archaeological sites - spanning from Palaeolithic stone tools to defence structures of the First World War. In order to create a digital inventory, it was necessary to define standards for archaeological as well as spatial data. Based upon these,

the project "Bestandesaufnahme Kulturgut" was started to transfer site-specific information of analogue archives to the digital database. Reviewed coordinates are displayed in a GIS-Service as point features along with polygons for sites with a spatial extent. For the operational management of archaeological sites the ultimate aim is to provide a platform that allows a quick assessment of the local situation when working on applications for planning permissions. Along the way, choices concerning the standards and the selection of sites had to be made constantly. In regard to the question of public access to this data, it will be essential to balance the gain of open data with the potential risks involved.

4 INFRASTRUCTURES FOR ARCHAEOLOGY IN NORWAY

Author(s): Uleberg, Espen - Matsumoto, Mieko (Museum of Cultural History, University of Oslo) - Ore, Christian-Emil (Department of Linguistics and Scandinavian Studies, University of Oslo) - Kile-Vesik, Jakob (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

The Norwegian university museums have worked together in the organization MUSIT since 2007 with the aim to create common database systems. MUSIT continues the work started in earlier projects from the 1990s. MUSIT is now a national infrastructure used for sharing information as open data through unimus.no. Currently around 1.4 million entries representing over 80% of the archaeological collections in Norway have in this way been published at unimus.no. Most of the finds are georeferenced, often with links to the national SMR. Images are published as CC 4.0, BY-SA.

The infrastructure project ADED (Archaeological Digital Excavation Documentation) started in 2018. The aim is to present excavation documentation in Norway as open data. The documentation from rescue excavations can be published in this way soon after the field work. The university museums have used Intrasis (<http://www.intrasis.com/>) for excavation documentation since 2011. This gives a good starting point for gathering the core data from all projects and to create a system that allows queries across all earlier projects.

The museum of Cultural History also publishes all excavation reports at DUO, the research archive at the University of Oslo (duo.uio.no).

The Directorate for Cultural Heritage in Norway is partner in ADED. The system created by ADED will link the excavation documentation and the Norwegian SMR. An offspin of the ADED-project will be deep linking between museum collections, excavation documentation, excavation reports and photographs.

5 GEOINFORMATION SYSTEM FOR SIBERIAN ROCK ART

Author(s): Kazakov, Vladislav (Novosibirsk State University; Novosibirsk State University of Economics and Management) - Kovalev, Vasily - Zhumadilov, Kair - Lbova, Lyudmila (Novosibirsk State University) - Simukhin, Aleksandr (Institute for Mongolian, Buddhist and Tibetan Studies SB RAS)

Presentation Format: Oral

A special task of archaeological researches is the mapping of rock art, which is impossible without the use of modern geoinformation technologies. Geoinformation systems (GIS) not only realize the needs of data mapping, but also solves the problems of statistical, demographic analysis, spatial patterns identification. To date, the GIS use in archaeology is rarely sufficiently developed, the created projects are often either highly specialized or have not been supported for a long time. At the same time, the application of the GIS technologies in archaeological researches, as well as in the field of cultural heritage, has now been formed as an independent interdisciplinary research area.

To effectively conserve and present data on rock art images and their location, an advanced geoinformation system is required, coupled with a content management system published in web access. At the same time, the openness of databases on petroglyphs in the absence of a complex of protective measures (establishing the open-air museums with a regime of controlled cultural tourism) can lead to the destruction of the most important examples of rock art. Archaeologists, with good reason, refuse to publish the exact geographical coordinates of the petroglyphic monuments studied, whether they are compact clusters, perhaps related to ancient sanctuaries, or scattered in large area image ensembles.

The presentation shows a geographic information system on the petroglyphs of the Southern Siberia – project artemiris.org that includes an interactive map with rock images locations, their description, dating, cultural and methodological attribution etc. The GIS shows the location, attribution and description of individual rock art panels. There is implemented user access model that hides monuments locations from broad user groups, allowing it only for science organizations staff by e-mail request.

This work is supported by the Russian Science Foundation under grant 18-78-10079.

6 FRAGMENTATION, INNOVATION AND THE PRICE OF COMMERCIAL ARCHAEOLOGY

Author(s): Tsamis, Vasileios (University College London)

Presentation Format: Oral

Archaeology in the United Kingdom has adopted the competitive tendering model in an effort to become a commercial sector and disentangle from direct public funding since the introduction of PPG16. Its evolving working model has been gradually influencing archaeology across Europe with some countries resisting and others embracing it.

This paper will analyse the impact of data capture on commercial archaeology in the UK and its advantages when collaborating

with other institutions. It will also critique the fundamental limitations when operating in a competitive tendering environment and the possible ways of addressing fragmentation and competitiveness. In particular it will address the impact of local authorities and government bodies in recommended data capturing methodologies and their adoption or not by commercial units.

This presentation will be based on personal working experience during the last 10 years in the UK and from different posts and organisations. It will be a personal journey on the fundamental change digital data capture has brought to our field drawing examples from large scale projects, collaborations among companies and institutions.

In addition, this paper will compare data capture and analysis on a company level, company collaboration level and the role of non-commercial institutions in providing a consensus and common standards.

7 SHARING GEO-SPATIAL CULTURAL HERITAGE LANDSCAPE DATA IN IRELAND: THE OPEN TOPOGRAPHIC DATA VIEWER

Author(s): Corns, Anthony (The Discovery Programme/CHERISH) - John, Gareth (Department of Culture, Heritage and Gaeltach's National Parks and Wildlife Service - NPWS) - Keane, Margaret (Department of Culture, Heritage and Gaeltacht's National Monuments Service - NMS) - Shaw, Robert (The Discovery Programme/CHERISH) - Verbruggen, Koen - Lee, Monica - Carey, Shane (Geological Survey of Ireland - GSI) - Stanley, Michael - Swan, Ronan (Transport Infrastructure Ireland - TII)

Presentation Format: Oral

Remote sensing data such as geophysics, satellite and Lidar data has revolutionized the prospection, management and visualization of archaeological monuments and landscapes. However this data is expensive and sometime difficult to acquire. Often different organisations sometimes duplicating data collection, which has already occurred in some locations within Ireland. Organisations will also generally commission data collection campaigns over focused areas for a specific project aims whilst secondary reuse of the data is often not considered in the original specification.

Over the past 10 years, efforts to improve the sharing and reuse of geo-spatial data within the archaeological and cultural heritage community within Ireland have been developed in order to make best use out of this data. One such initiative is The Open Topographic Data Viewer project: a collaboration between Geological Survey Ireland (GSI), the Department of Culture, Heritage and Gaeltacht's National Monuments Service (NMS) and National Parks and Wildlife Service (NPWS), Transport Infrastructure Ireland (TII) and The Discovery Programme: Centre for Archaeology and Innovation Ireland within the remit of the Heritage Council. The aim of this viewer is to host Lidar from all interested government and non-government organisations and to build up a mosaic of available data across the country. This high quality topographic data has many applications beyond the original capture focus, and making them freely available will definitely stimulate new research and improve existing products and techniques.

This paper will explore how this initiative was established, what has been achieved with the roll out of the Open Topographic Data Viewer within the archaeology community and explores effort in making additional remote sensing data sets available through initiatives such as ARIADNEPlus, Europeana, CHERISH and E-RIHS.

150 DECOLONISING SPACE

Theme: Archaeological theory and methods beyond paradigms

Organisers: Licerias-Garrido, Raquel (Digital Humanities Hub - History Department, Lancaster University) - Favila-Vázquez, Mariana (Museo de Templo Mayor, INAH) - Bellamy, Katherine (Digital Humanities Hub - History Department, Lancaster University)

Format: Regular session

Colonial perspectives have dictated many areas of interpretation within the fields of Archaeology, Anthropology and History since their inception, influencing discourse, terminology and approaches to past and present communities. This perspective has created imbalances of power between cultures but also between the researcher and 'the researched'. In recent years, many voices have emerged which stress the need to question this Western European mainstream discourse, and instead explore other dynamics and models of thinking which enrich our understandings of societies, rather than continuing to perpetuate colonialist understandings.

Focusing on the concept of space, this session aims to discuss the multitude of ways to 'be in space' around the world and through time, adopting a critical stance to the dominant Cartesian logic. The session welcomes methodologies developed to explore understandings of space, alongside topics related to: the understanding and conceptualisation of space, relationships between time-space and kinship-space, local concepts of space, local geographies, social landscapes, spatial materiality, and textual or pictorial depictions of geographies. These topics are by no means exhaustive, and innovative proposals which are related to the decolonisation of space in ways we have not mentioned are more than welcome.

1 **GEOGRAPHICAL DICHOTOMIES IN MESOAMERICAN STUDIES: THE CASE OF INDIGENOUS NAVIGATION**

Author(s): Favila Vázquez, Mariana (Museo Templo Mayor, INAH)

Presentation Format: Oral

Archeological studies regarding pre-Hispanic mechanisms of environment appropriation have been crucial to explain the complexity of Mesoamerican societies. However, an ontological dichotomy of water and land has permeated these investigations for decades. The activities practiced on the mainland, such as agriculture, among many others, are the preferred focus of interest for explaining indigenous social and historical processes. The activities and the role of the aquatic spaces are generally considered subordinate or secondary concerning the former. Through archaeological, iconographic and historical evidence this paper argues that Mesoamerican cultures, such as the Olmec, Maya, and Aztec, had a perception of the environment in which, although water was of course distinguished from the mainland, it was not seen exclusively as an opposite space, liminal and independent to the political, social, economic and religious dynamics of the indigenous people. Evidence of this is the development of a complex nautical technology that was permeated by the religious and ideological configurations of the societies that produced it. Consequently, navigation was practiced as a landscape connectivity system that integrated the use of waterways, coastal lagoons, wetlands, and estuaries, along with roads and activities in the mainland. This study allows for rethinking the valuation of aquatic spaces and getting closer to the local perception of the environment, in which the aquatic spaces are no longer the limit of the territories inhabited by humans.

2 **REFOCUSING WITH AN INDIGENOUS LENS: THE ALTEPETL IN SIXTEENTH-CENTURY MEXICO**

Author(s): Bellamy, Katherine (Digital Humanities Hub - History Department, Lancaster University)

Presentation Format: Oral

The dominance of Western European discourse is not a new phenomenon. Rather, this is a tradition which extends back centuries and has, as a result, often altered and obscured our understandings of history. This paper will focus on a socio-political entity which was prevalent in the area we now know as Mexico, which has been variously misinterpreted and misrepresented since the arrival of the Spanish in the 16th century, namely, the altepetl.

Derived from the Nahuatl *lyn atl, yn tepetl* ("water, mountain"), the two elements deemed essential to any Mesoamerican political entity, the altepetl was of both philosophical and physical significance in Nahua society. During the early 16th century, the translation of altepetl into Castilian redefined its concept. Altepetl was defined by the Spanish as 'pueblo' (town), and huey-altepetl (great altepetl) as 'ciudad' (city). While the Spanish primarily understood 'altepetl' as an urban or political concept, it is now known that Nahua definitions extended to symbolic, aesthetic, ecological and geographical connotations. In the last 20 years, a great deal of research has been conducted aiming to clarify the concept, but also its original manifestation in the historical and archaeological record. Despite this, the altepetl's complex nature and intricate transformations has meant that its true conformation remains ambiguous, with considerable scope for further research.

In this paper, I will explore the different understandings of the altepetl, and how these understandings have often been obscured by a distinctly Western lens rather than focusing on indigenous knowledge of these entities which were so essential to the functioning of Nahua society. In doing so, I aim to examine the issues associated with employing a strictly Western approach, and, most importantly, both the necessity and value of centring indigenous knowledge, particularly when investigating indigenous concepts.

3 **ONTOLOGICAL CONSIDERATIONS ON ILLYRIAN CITIES**

Author(s): Bekteshi, Arba (University of Tirana)

Presentation Format: Oral

During my work in Apollonia, Albania with the Franco-Albanian expedition in the summer of 2014, being an anthropologist I had informed French archaeologists that a bunch of cuboid-shaped structures placed over each other had been thrown from a previous mission like one of the local annual workers had told me. Somewhat relieved the foreign professors returned to me and repeated their concerns like a mantra: "There is no place in the world similar to Apollonia." Their concern was based on the fact that Apollonia's architecture is difficult to compare to that of any other cities in the region or elsewhere, and hence an impossibility to translate it and reach exhaustive conclusions on it.

Thus, this presentation focuses on ways to decolonise Albanian archaeology away from Soviet frameworks and to engrave new engagement spaces with the materiality of the Illyrian urban period in present-day Albanian territories, aware of the need to move forward with the analytical tools provided by ontology relying on new materialism without any predefined frameworks and vectors.

This is not to reinforce claims that the proposal to consider the possibility of engaging with relational ontology is the latest fashion that dictates how things operate in a given situation (Alberti et al 2011, 910).

In this paper, focusing on the development and demise of Illyrian cities, I demonstrate that ontology in archaeology presents the opportunity for producing conditions, such as theory, materials, past, new ones that change. According to Alberti, ontology

helps archaeology create a place for open questions, and after each discovery pushes on real changes over how to conceive the past (2011). Also, the use of ontological approaches in archaeology, while contributing to the meaning of new worlds, does not participate in the constructs of what did not exist (Alberti et al., 2011, 900).

4 THE WORDS WE USE AND THE INTERPRETATION OF THE PAST: REFLECTIONS ON THE STUDY OF RURAL SPACES

Author(s): Stagno, Anna Maria (University of Genoa - Laboratory of Environmental Archaeology and History)

Presentation Format: Oral

The paper aims to explore the similarities and the different trajectories of two phenomena which share the same roots: the colonial perspective and the urban dominant consideration of rural areas. The colonialist divide, its ideological background and its consequences in the interpretation of the past societies of the colonies have been already acknowledged and the post-colonial perspective is well established in the archaeological theory. On the contrary, what happened in the interpretation of rural areas since the late 18th c., with the establishment of the opposition urban/rural world and the human/nature dichotomy is far to be recognised in all its consequences for the archaeological study and interpretation of our past. The physiographic theories of the 18th c. informed that framework, as well as the rationalisation of the 19th c. and the modernisation of the 20th c. At the same time, those theories activated the process of 'folklorisation' of rural societies, with the underestimation of the local environmental knowledge, the progressive annulment of the local practices of environmental resources management, and the consequent marginalisation of mountain areas. The current 'heritagisation' of mountain areas, promoting their supposed wilderness and "a-temporality" could be considered the ultimate effect of this process. To change it, archaeology is playing a key role providing a new historical narrative on mountain areas, however there is urgency for a reflection on the origins and the ideological dimension of many concepts and words (e.g. the opposition cultivated/uncultivated lands, private property, human impacts, etc.) which archaeology employs to decipher the rural spaces and societies. Many of them find their codification in the 18th c. theories. The idea is that the words we use orient our interpretation of the past, and the aim is to show that archaeology needs to decolonise or, maybe, "de-urbanise" the study of rural areas.

5 DECONSTRUCTING AN IMPERIAL IDEOLOGY – HISTORICAL ARCHAEOLOGY OF THE FASCIST COLONIZATION OF ISTRIA

Author(s): Lorber, Crtomir (University of Ljubljana)

Presentation Format: Oral

Every culture has a distinctive perception of its social environment. We may see this in very tangible differences between spatial patterns of different cultures in prehistory, antiquity, medieval age and it can also be observed during the industrial revolution, when the industrial civilization transformed the landscape and spatial patterns of human behaviour. But even in industrial era there are differences between different societies. The paper plans to analyse a social environment heavily influenced by ideology – Italian fascist mining colony of Raša in Istria, near Labin coal mines.

This paper considers whether it is possible to analyse a fascist colony in archaeological terms. Since such settlements are an expression of ideology in material world, it should be, as archaeology primarily studies material culture. Any interpretation should be built upon a clear theoretical basis – we propose that the work of a French philosopher Henry Lefebvre represents such a foundation. Lefebvre stated that any independent social order builds a unique social space. This is interpreted through the prism of sensed-thought-felt matrix of spatial understanding that offers a tool for the interpretation of the material incarnations of ideological foundations of fascism in material culture.

The paper offers a specific viewpoint when dealing with the question of decolonization and deconstruction of ideological narratives. Fascism has represented itself as a social revolution and its' conceptualization of space should be unique and different from other industrial societies. This paper maintains it is not. It shows that fascist colonial practices are similar to other industrial societies; especially since its closest analogies are found in other industrial settlements found near factories and mines. As such it offers a thesis that any uniqueness of fascist colonies is to be considered as a specific variation of European industrial colonialism and not as a unique type of Western colonialism.

6 DIGGING FOR THE DICTATOR: HISTORICIZING EXCAVATION SITES

Author(s): Wirth, Christa (University of Agder)

Presentation Format: Oral

In this paper, I will discuss the excavation site as a space that needs to be historicized. By means of historical-critical analysis, I will look at archaeological sites in the post-World War Two period in the Philippines. In this time excavation sites in the Philippines became locations of great public resonance as they provided Philippine society access to a history that was untouched by the Spanish and U.S. Empires that colonized the Philippines for 350 years. The Philippines did not become independent until 1946. The excavation sites, as I will argue, became national landmarks where decolonization took place. However, U.S. influence and anxieties over the spread of communism in Asia, and Philippine nationalist efforts resulted in archaeologists providing ideological support for Ferdinand Marcos' dictatorship. The excavation sites became symbols of Marcos' power. Thus, the interpretation of the excavation site as contested space unfolds at the nexus of decolonization, nationalism, and the Cold War.

A. REINTERPRETING THE LANDSCAPE OF THE BELL BEAKER PHENOMENON IN THE INNER IBERIA

Author(s): Paulos Bravo, Rodrigo (Complutense University of Madrid)

Presentation Format: Poster

The study of the landscape of the inner Iberia during the Calcolithic period has never been a priority in previous studies, let alone its importance in the appearance of the Bell Beaker phenomenon among the Copper Age societies. Through spatial analysis we could reinterpret the relationship between these societies and the landscape, getting to know better their idiosyncrasies and the nature of the observed phenomena inside them. The present work shows the preliminary results of the landscape analysis that is being carried out currently in the Bell Beaker sites of the territory included in the Henares' upper basin (Guadalajara, Spain) and Ambrona Valley (Soria, Spain). In doing so, we intend to deconstruct the phenomenon and get better knowledge about the structure that underlies it. Mobility, relationships between groups and the exploitation of critical resources could be important keys to help comprehend how those people perceived the physical space, creating a landscape that can only be understood through such a detailed study.

152 APPROACHING HEALTH STATUS, HEALTH CARE AND PEOPLE'S WELLBEING IN THE PAST FROM A DENTAL ANTHROPOLOGICAL PERSPECTIVE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Kolp-Godoy Allende, Maria (Department of Archaeology, Prehistoric Archaeology Division, University of Zurich) - López Onaindia, Diego (Unitat d'Antropologia Biològica. Departament BABVE. Facultat de Biociències, Universitat Autònoma de Barcelona)

Format: Regular session

Teeth are hard and tough! They are the best-preserved tissue and source of information about people's lives, encounters, and interactions in archaeology.

As they develop throughout an individual's life, different nutritional and physiological disturbances affecting health from childhood, leave permanent traces on the individual's teeth. Once teeth have formed, they are prone to modifications resulting from attrition, intentional alterations, and pathological conditions. Consequently, the assessment of dental markers, pathologies, and biochemical analysis of dental tissues provides insights into the episodes of disruption, pathological susceptibility and epidemiological events that a population endures over a specific period.

Undoubtedly the analysis of teeth has undergone extensive transformations during the last decade. New options arise from advances in analytical dental histology and biochemistry, such as the introduction of DNA analysis of pathogens preserved in oral tissues, improving the accuracy of applied techniques and results, and pushing forward previous analytical limitations, particularly our own research questions. These have evolved from mere dental pathological characterizations towards a more comprehensive understanding of health status and care of studied populations.

This session seeks to integrate a variety of dental studies following this holistic approach to infer health status and well-being in past populations by integrating dental studies combining diverse methodological approaches and sources of information. To integrate dental studies that provide insights into biological, sociocultural and behavioral components, and a picture of people's daily lives, involving health care, healing strategies and people's attitudes towards diseases.

You are welcome to present outcomes of recent research, methodological improvements or experimental studies. Case studies, comparative studies, overviews, uni- and multidisciplinary research papers are also welcome! We are pleased to discuss methodological and theoretical challenges in working with teeth, the somewhat hidden role of health care in past societies, and the potential for it to be traced through the analysis of teeth.

ABSTRACTS

1 INTRODUCTION TO SESSION #152: APPROACHING HEALTH STATUS, HEALTH CARE AND PEOPLE'S WELLBEING IN THE PAST FROM A DENTAL ANTHROPOLOGICAL PERSPECTIVE

Author(s): Kolp-Godoy Allende, Maria (Department of Prehistoric Archaeology, University of Zurich) - López Onaindia, Diego (Unitat d'Antropologia Biològica. Departament BABVE. Facultat de Biociències, Universitat Autònoma de Barcelona)

Presentation Format: Oral

To understand the concept of health and healthcare is more complicated than what is commonly thought, as the definition of health embraces many dimensions and methodological approaches in itself (Wiley and Allen 2009). For the WHO health is a state of complete physical, psychological, and social well-being, and the functional ability to operate under changing circumstances (Whitaker 2006:2, Winkelman 2009). Healthcare is understood as the act to provide medical treatments and medicines to improve a person's well-being (BD 2019). However, this sense of well-being and healthcare varies over time and between societies (Wiley and Allen 2009). From a biocultural approach, the notion of health emphasizes the individual's ability to recover from insult, as part of a continuous process of adjustment to environmentally adverse situations (Bush and Zvelebil 1991). While bioarchaeology appeals for a holistic notion of health and care. It integrates biocultural and environmental factors to comprehend the general health status of a population to which an individual belongs, without discrediting the importance of differential

diagnosis of specific diseases in the reconstruction of a society's health and care, even if healthcare in past populations is still rarely assessed.

To approach health and healthcare from a dental anthropological approach is even more difficult. We know that as teeth develop throughout an individual's life, different nutritional and physiological disturbances are affecting health from childhood, leave permanent traces on teeth. Consequently, the assessment of dental markers, pathologies, and biochemical analysis of dental tissues provides insights into the episodes of disruption, pathological susceptibility and epidemiological events that a population endures over a specific period. New microscopic methodological approaches are nowadays making it possible to improve the accuracy of applied techniques and results, pushing forward previous analytical limitations, particularly our research questions focused on people's daily lives and healthcare in the past.

2 **TEETH AREN'T PEARLY, UNTIL YOU SMILE: DENTAL ANALYSIS FROM SIDON (LEVANT, MIDDLE BRONZE AGE)**

Author(s): Kharobi, Arwa - Stantis, Chris - Maaranen, Nina - Schutkowski, Holger (Bournemouth University)

Presentation Format: Oral

Ongoing excavations at College Site, Sidon (Lebanon) have revealed dual identities: a coastal city with heavy reliance on the extensive hinterlands, and a nexus of far-reaching trade with major ritual centers.

This research explores oral health indicators, dental morphology, and stable isotopes data to identify differences between the people interred in different burial complexes (i.e. simple graves, stone-lined graves, brick-lined graves and jar burials) of the various phases of Middle Bronze Age (c. 2000–1600 BCE) in Sidon.

The data, produced from a total of 113 skeletons, were compared within, as well as between, the contexts. Most differences emerged when comparing the prevalence rates of dental diseases and other oral health indicators (i.e. dental attrition, caries, periodontal disease, ante-mortem tooth loss, and calculus deposits) in males and females between the contexts. While mobility isotopes show homogeneous values, with few exceptions, suggesting coastal residence; dietary isotopes, however, indicate an almost total reliance on terrestrial resources despite the prevalence of fish bones in burial contexts and ritual offerings. The nonmetric dental traits (using ASUDAS) of Sidon individuals are highly uniform overall, following rates and degrees of expression observable across coastal Lebanese sites.

In general, favorable conditions seem to reflect the socio-politically stable climate of the time and suggest a thriving community with well-established trade links. This dental research has generated a synthesis of bioarchaeological evidence-dental pathology and morphology, as well as stable isotopes- to investigate lived experiences in the Middle Bronze Age.

This project has received funding from the University of Bournemouth and from the European Research Council (ERC) under the European Union's Horizon 2020 Research and Innovation Programme (Grant Agreement No 668640).

3 **SUBSISTENCE, ORAL HEALTH, AND INTERACTIONS IN THE CENTRAL MALI DURING THE 7TH AND 19TH C. AD**

Author(s): Dlamini, Nonhlanhla (University of Geneva) - Sealy, Judith (University of Cape Town) - Mayor, Anne (University of Geneva)

Presentation Format: Oral

This paper will discuss the results of our research, which focuses on understanding the lives of pre-Dogon and early Dogon people in central Mali during the 7th and 19th c. AD. We have studied a large sample of skeletal remains of individuals from the collective burial caves of the Bandiagara Escarpment. 220 dentitions were examined for signs of disease and wear, carbon and nitrogen isotopes were measured on 175 bulk dentine samples, while a sub-set of teeth (n = 39) with incremental $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ data reveal further information at an individual level. In addition, 41 teeth are being analysed for palaeo-microbiology in order to search for microorganisms, including *Yersinia pestis*, which may have afflicted these prehistoric societies. So far, 86 AMS radiocarbon dates allow us to establish a new chronology for the funerary practices.

Our isotope results shed light on the temporal evolution of diet between pre-Dogon and Dogon periods, and a geographic distinction in foodways at the southern and northern ends of the Escarpment. Furthermore, inter-site differences demonstrate that communities were disposing of their dead in different caves. Consistent with previous archaeological and ethnographic evidence, these results attest to a complex history of settlement and foodways.

Intra-individual isotopic shifts in $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ indicate great diversity in personal experiences pointing to differences in nutritional and health status. These results also provide information on some important milestones for these past communities, such as breastfeeding, weaning, childhood foraging, pregnancy and habitat change related to marriage.

4 **STORIES OF TEETH. DIETARY LIFESTYLES OF BRONZE AGE PEOPLE FROM THE EASTERN CARPATHIAN BASIN**

Author(s): Gál, Szilárd (Romanian Academy. Institute of Archaeology and History of Art of Cluj-Napoca)

Presentation Format: Oral

Our investigation focuses on the bio-archaeological analysis of the Bronze Age communities from Eastern Carpathian Basin. The central directive of the project is to identify or to disprove the historical consequences of metals as agents of status and iden-

tity in Bronze Age burial grounds. Our study is based on osteological samples collected from important burial grounds of this period (inhumation and cremation graves): Luduş-Fabrica de Cânepă (Romania), Carei-Bobald (Romania), Sebeş-Între răstoace (Romania), Törökszentmiklós-Kengyeltenyősziget (Hungary). Beside morpho-taxonomical analysis, our investigations implied two further different methods in collaboration with the University of Medicine, Pharmacy, Sciences and Technology of Târgu Mureş: biochemical investigations (analysis of dental calculus: level of oxalate, phosphate, carbohydrates in dental plaque, microscopic structure of the calculus) and dental morphological analysis (2D image analysis) in order to identify connection between health status and dental diseases.

With biochemical and mesoscopic analysis of the teeth we intend to identify marks of lifestyle and dietary differences/transformations in graves with or without metal objects.

The present paper aims to present health status and dietary differences in micro-regional communities from the Eastern Carpathian Basin.

5 HEALTH STATUS AND DIET DURING THE MIDDLE NEOLITHIC IN THE NORTHEAST OF THE IBERIAN PENINSULA

Author(s): López Onaindia, Diego - Subirà, M. Eulàlia (Unitat d'Antropologia Biològica, Universitat Autònoma de Barcelona - UAB)

Presentation Format: Oral

Dental pathological indicators have been used for a long time in order to infer health status in archaeological collections. These indicators include the presence of cavities, dental plaque, periodontal disease, or the presence of enamel hypoplasias. It has been suggested that due to the inclusion of a diet rich in carbohydrates during the Neolithic, the health status of the individuals and the populations got worse. This has mainly been suggested by the increase in the observed prevalence of cavities in this. In this work, we present the results of dental pathologies and isotope data of nearly 500 Neolithic individuals from the northeast of the Iberian Peninsula. We show the relations between different pathological indicators and their relationship with the dietary proxy. We have analysed these variants using multivariate statistics. Therefore, we aim to determine whether the presence of certain pathologies is related, and also whether fluctuations in the diet component may affect the presence of concrete pathological indicators.

6 FROM MODERN TO CONTEMPORARY SOCIETIES (LATE 16TH-EARLY 20TH CENTURY): EVOLUTION OF HEALTH STATUS IN TWO SOUTHEASTERN FRANCE POPULATIONS

Author(s): Perrin, Marie - Schmitt, Aurore - Ardagna, Yann (Aix Marseille Univ, CNRS, EFS, ADES)

Presentation Format: Oral

Health status of modern and contemporary population has hardly been investigated in France from biological material. The period covering the late 16th to early 20th century, has long been set aside from bioarchaeological concerns and few modern cemeteries have been excavated. Yet, it witnessed many significant transformations in socioeconomic, political and cultural spheres that led on to the threshold of modern industrialized societies.

The recent excavations of two cemeteries, St Jacques in La Ciotat, (1581-1831) and Les Crottes in Marseille (1784-1905), have allowed the constitution of a considerable osteological assemblage. It offers the unique opportunity to study on a large scale the evolution of health state during that peculiar period and specifically during the early time of industrialization.

A complete macroscopic analysis of oro-dental pathologies was carried out on 669 individuals. Ante mortem tooth losses, dental caries, calculus, dental wear, periapical abscesses and periodontal disease were considered as indicators of oral health. Moreover, the examination of dental enamel hypoplasia was assessed for every preserved tooth. This non-specific stress marker suggests physiological disturbances during childhood, mainly caused by nutritional deficiencies and infectious diseases.

The results reveal a high and rising prevalence of caries and ante mortem tooth losses in a context of important dietary changes, a lack of oral hygiene, and a limited access to dental care. The examination of dental enamel hypoplasias indicates that deficiencies were very usual during childhood. If food shortages became scarce by the 19th century, the increase of hypoplasia could reveal no real improvement in the quality of everyday diet. Also, large urbanized centre, such as Marseille, became rapidly overcrowded from the 1830s, leading to poor sanitary conditions that emphasised the development of infectious diseases.

7 MICROSCOPIC AND VIRTUAL APPROACHES TO ORAL PATHOLOGY: A CASE STUDY FROM EL MIRADOR CAVE (SIERRA DE ATAPUERCA, SPAIN)

Author(s): Lozano, Marina - Willman, John - Hernando, Raquel (IPHES; URV) - Ceperuelo, Dolors (UIC)

Presentation Format: Oral

Dental and oral status is a valuable indicator of health, diet, and lifestyle of past populations. The assessment and diagnosis of oral pathologies has improved through advances in microscopy for external surface observations and high-resolution medical imaging equipment (cone beam computed tomography [CBCT] and microcomputed tomography [microCT]) for internal/virtual observations. However, some of these advances are not only expensive but also time-consuming and not always accessible, thus limiting their applicability for scoring dental pathologies of large burial assemblages.

The aim of this contribution is to assess suitability of several high-resolution imaging methodologies (microCT, CBCT, scanning

electron and digital microscopy) to score, describe, and analyze oral pathologies in a sample of 23 individuals of both sexes and various ages. This assemblage comes from the Chalcolithic collective burial of El Mirador Cave (Sierra de Atapuerca, Spain) dated between 4000 ± 30 BP (4550-4390 cal. BP) and 4120 ± 30 BP (4880-4480 cal. BP).

The identified oral pathologies, disorders, and additional comorbidities include dental caries, abscesses, cysts, linear enamel hypoplasia, periodontal disease, dental calculus, supernumerary teeth, misalignment, antemortem tooth loss, exostoses and arthritis of the temporomandibular joint (TMJ) related to inflammatory lesions, developmental stress conditions, and infections. The analysis of some of these pathologies beyond the traditional macroscopic analysis allows a more in-depth characterization and improved precision of differential diagnoses. Also, the images and data resulting from microscopic, CBCT, and microCT analysis provide useful information not only for research but also for teaching and outreach dissemination purposes.

8 BIOARCHAEOLOGICAL RESEARCH ON PULP CALCIFICATIONS

Author(s): Nicklisch, Nicole (Danube Private University Krems; State Office for Heritage Management and Archaeology Saxony-Anhalt – State Museum of Prehistory) - Schierz, Oliver (Poliklinik für Zahnärztliche Prothetik und Werkstoffkunde, Universitätsklinikum Leipzig) - Enzmann, Frieder (Institut für Geowissenschaften, Johannes Gutenberg-Universität Mainz) - Knipper, Corina (Curt Engelhorn Centre Archaeometry gGmbH) - Friederich, Susanne (State Office for Heritage Management and Archaeology Saxony-Anhalt – State Museum of Prehistory) - Alt, Kurt (Danube Private University Krems; Institute of Prehistory and Archaeological Science)

Presentation Format: Oral

Pulp stones or denticles are small nodular hard tissue bodies which can occur single or multiple in the dental pulp, and may interfere with access to the root canal during endodontic therapy. In clinical diagnostic the prevalence of pulp stones is underestimated, though incidences may vary significantly. This variability can be explained methodologically (digital volume tomography) but population-specific differences could play a major role, too. Moreover, etiologically links to trauma, dietary effects or even cardiovascular diseases are discussed. Thus, pulp stones represent very interesting structures for palaeopathological issues. The evidence in archaeological skeletal remains can be significant, especially in connection with pathological findings and dietary reconstruction. In the present study, skeletal finds from the Neolithic and modern times excavated in Saxony-Anhalt, Germany, were examined for the presence of pulp stones using digital volume tomography (DVT) images. It was analysed whether the development of pulp stones can be correlated with ageing, dental wear, dental pathologies, and dietary habits. This contribution presents preliminary results.

9 HEALTH CARE AND PARACAS CRANIAL TREPANATION IN CABEZAS LARGAS, SOUTH COAST OF PERU (400 – 100 BC)

Author(s): Lévy Contreras, Jessica (Independent researcher) - Kolp-Godoy, Maria (University of Zurich) - Watson Jiménez, Lucía (Universidad Científica del Sur) - Fernández Valdivia, Ana (Centro de Investigaciones en Antropología Biológica y Genética)

Presentation Format: Oral

For over a century archaeologists have used teeth to address health in past populations. Today, the microscopic analysis of dental residues like calculus and cariogenic sediment makes it possible to explore medical attendance in past societies. This research seeks to evaluate from a dental anthropological approach, healthcare on individuals where cranial surgeries (trepanations) were performed.

A small sample (n = 5) composed by female and male adults is considered in this study. Three of them with clear signs of cranial trepanation, and two of them still have hair and a cotton wrapping on their head, where the possibility of a trepanation cannot be ruled out. All individuals come from a Paracas tomb related to the end of the Early Horizon (400 – 100 BC). This burial of unprecedented character was excavated by Engel in the end of the 50s at the Cabezas Largas site, located on the south coast of Peru.

Once the cariogenic and tooth-wear conditions were analyzed, a microscopic analysis of dental calculus and cariogenic sediment was conducted to detect phytoliths and starch grains, and also the consumption of medicinal plants that could show the care given to surgically operated individuals in the past. In micro-rests of cariogenic cavity and dental calculus of four individuals, the remains of phytoliths and starches were identified. Apparently, the individuals consumed a rich diet of well-processed and cooked starches. Phytoliths identified included panicoid, trichoma, bambusoide, epidermal and parenchyma, which suggests the consumption of medicinal plants of Andean vernacular use, particularly those from the Asteraceae family. Additionally, the finding of sponge spicules and diatoms indicates the consumption of algae perhaps with medicinal purposes. The individuals who received surgical intervention consumed a diet rich in starches and medicinal plants, which suggests other people's care for the individual's recovery.

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Andersson Strand, Eva (Centre for textile Research, Saxo institute, University of Copenhagen) - Hedenstierna-Jonson, Charlotte (Department of Archaeology and Ancient History, University of Uppsala) - Vedeler, Marianne (Museum of Culture History, University of Oslo)

Format: Regular session

The half-millennium from 650 to 1150 saw fundamental changes in Scandinavian societies, from central chiefdoms on the periphery of Europe to well-established Christian kingdoms with new types of economical systems and trading structures. State formations, urban systems and the influences of Christianity as well as warfare, exploring and colonizing regions outside Scandinavia were important parts of this development. New trade routes developed and the modes and organisation of production changed. Although it is well-known that cloth cultures had an important impact on the societal development, this perspective is yet to be fully integrated into the general discussion of the social, economic and cultural changes that took place during this period.

In this session the aim is therefore to explore the variety and function of household textiles in the Viking Age. We invite scholars to discuss issues including the textiles' variety of functional areas, from practical purposes such as bed linen and wall insulation to storytelling and preservers of collective myths. Furthermore, the house as a three-dimensional context will be considered, not forgetting the space created within the walls, the interior. This is a kind of spatial archaeology that often is lost when interpreting houses from post holes and hearths. How was a room furnished and how was it perceived by the people moving in the interiors of a house? In this session textiles become decisive elements in the shaping of a living space, not just in terms of functionality, but as a means of making a home.

ABSTRACTS

1 HOUSEHOLD TEXTILES IN THE VIKING AGE SCANDINAVIA

Author(s): Andersson Strand, Eva (Centre for Textile Research, Saxo institute, University of Copenhagen)

Presentation Format: Oral

"In the hall at Oseberg, bedecked for a banquet, we beheld a vivid contrast: On the benches, there were cushions matching the unassuming hangings on the lower walls, which were simple yet striking in appearance with an endlessly repeating pattern in a subtle check of at least three colours. But above the heads of the seated guests, there ran a banner with a frieze in a vivid variety of powerful colours showing a frenzy of adventures from the sagas and the myths". (Hougen 2006, 169, translation Jane Malcolm-Davies 2019).

This is a very vivid description of how a Viking Age hall could have been equipped but also one of the very few interpretations of this. When the Viking Age textiles are discussed, the focus is often on clothing and fashion while the need for sailcloth is only discussed in a few research projects. Yet, the use of and demand for household textiles are still lacking in the discussion of Viking Age textiles and textile production. One of the reasons for this is that only a few archaeological textiles have been found in settlement contexts. For textiles found in burials, the challenge is identifying which ones relate to clothing and which could be a part of the furnishing.

However, information from Old Norse texts gives a clear indication that the houses were well equipped with different types of textiles. This provides researchers with an insight into how Viking Age houses could have been furnished and the role of textiles in this. In this presentation, I will discuss these issues including the variety of areas in which functional textiles could be found, from practical purposes such as bed linen and wall insulation to cultural practices such as storytelling and the preservation of collective myths.

2 FURNISHINGS, STORAGE AND PRODUCTION: TEXTILES IN THE GARRISON AT BIRKA, SWEDEN

Author(s): Hedenstierna-Jonson, Charlotte (Uppsala University; Swedish History Museum)

Presentation Format: Oral

The Viking Age town Birka (Sweden) has provided a rich corpus of archaeological textiles and tools for textile production. Though fragmentary in character, the multitude of finds and their contexts convey many aspects of production, import and use as reflected through the settlement and the graves. There is however a context in which the use of textiles remains relatively unknown, namely Birka's garrison. Enclosed by ramparts and palisades, the garrison incorporated a great hall, as well as economy buildings and workshops. Evidence suggests that textiles were produced in the workshop area, while inside the hall weapons wrapped in textile were stored in locked cases along the walls. How was the hall furnished and how was it perceived by the people moving in the interior? Although the archaeological material is limited, this paper aims to explore the possible uses of textiles in this martial environment, from practical purposes such as bed linen and wall insulation to storytelling and preservers of collective myths.

3 LARGE SCALE PRODUCTION OF HOUSEHOLD TEXTILES IN NORTHERN JUTLAND OR SOMETHING ELSE?

Author(s): Sarauw, Torben (Historical Museum of Northern Jutland)

Presentation Format: Oral

The Limfjord area of Northern Jutland is characterized by numerous and large metal-rich sites dating from c. 400-1000 AD. Only a few sites have been excavated, but still a pattern occurs when the topsoil is removed, and the archaeological traces revealed. Thus, in the 7th and 8th centuries there was an explosive increase in the number of pithouses and often we only find a smaller number of ordinary longhouses. One site, Bejsebakken situated at the outskirts of Aalborg, revealed more than 400 pithouses. New analyses have shown that the major part of the pithouses were weaving or spinning huts, indicating that these buildings were now the primary location for textile production and that some form of specialisation and standardisation had taken place in the production. Textiles for clothing, and possibly also for ships' sails etc. were mass produced in the Limfjord area, where there were optimal conditions for sheep-farming and perhaps also a special maritime tradition. This presentation will discuss the character of the production of textiles in the pithouses, but also look at the interior of the pithouse as a living and working space. This presentation is part of the From Central Place to Urban Space-project funded by the VELUX FOUNDATION.

4 TAPESTRIES FROM OSEBERG – SPACE, PLACE AND FUNCTION

Author(s): Vedeler, Marianne (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

Exquisite tapestries found in a grave from the 9th century give a unique glimpse into a distant world of imagination and expression. Their figurative motifs probably represent myths and collective histories well known in the Viking Age society. How were they used, and for what purpose?

In 1904, a large burial mound was excavated in Vestfold, eastern Norway. Among the findings, there were more than 80 fragments of narrow tapestries patterned with figural motives. Part of the symbolism of these images can be linked to the warrior ideology and the myths surrounding it during the Viking era. We can see battle scenes, warriors in animal form and hanged men.

The tapestries from Oseberg are narrow, measuring only 16-23 cm in height. Both medieval poems and folk traditions suggests that tapestries were used as wall-hangings in the hall and near the high seat. For some reason, the wall-hangings grow higher as time goes by. Where they used as "memory sticks" for stories to be told at special occasions or are they just decorations? Several poems exist, written down during the Middle Ages, which describe the significance of tapestries when it comes to preserving and passing on collective narratives.

There are long traditions for the narration of collective stories through textile images in Norwegian and European history. There are obvious reasons for considering the Oseberg tapestries and the well-known Bayeux Tapestry as parts of a long tradition of creating textile imagery with a significant narrative role. They might have had a function as rhetoric tools in the game of power, telling the story as the owner wanted it to be told.

5 CREATING ATMOSPHERE IN A VIKING AGE KINGS HALL

Author(s): Demant, Ida (Sagnlandet Lejre; National Museum of Denmark)

Presentation Format: Oral

In these years Sagnlandet Lejre, Denmark, is creating the 8th century royal hall excavated in the nearby village of Lejre. It is a 61 m long house, which will contain rooms such as a 300 m² reception hall with richly adorned pillars and centrally placed high seats, as well as the king's bedroom. The intention is to create a living setting of a local king in the 8th century Zealand, to give an insight to the public about life, social status and view of the world in the Early Viking Age. However, one thing is the large project of building the house, another thing is to equip it with furniture and textiles to make it look like the room a king would use to receive his guests. Both pictures, ethnological and archaeological sources indicate that textiles has been of major importance, from richly decorated tapestries along the walls telling significant stories, to more mundane pieces such as cushions.

In this paper, I will present some of the thoughts, ideas - and dreams - we have for this project.

6 SURPRISING DISCOVERY ABOUT YARN AND WEAVE TECHNIQUES IN TABLET WEAVE FROM THE OSEBERG FIND

Author(s): Skogsaas, Bente (none)

Presentation Format: Oral

52 tablet woven bands from the Oseberg ship burial in Vestfold – Norway have been identified, dated AD 834 (Vedeler 2014). Many of the bands constitute a frame in what once was the interior décor at Oseberg: the Oseberg Tapestry. The weave techniques of the bands can be divided into five categories, Oseberg 34D is unique in that it was woven with several techniques (Nockert, 2006). The band was possibly a part of the tomb's interior décor (Vedeler 2014). It has received a lot of attention, but no reconstruction has been made based on microscope studies or close examination of the band.

Based on document and microscope studies of 34D, and of a further nine bands from the Oseberg find, analysis and tests were performed with practice weave samples in three phases. The study of yarn scraps from 34D revealed three-ply yarn in three hues: two wool threads and one thread probably in silk. The find brought new insight into material production in the Early Viking

Age.

In finds from the study of the nine bands, diverse techniques and patterns can be inferred, which allows a unique glimpse into local weave tradition. The bands have geometrical motifs, a Scandinavian tradition going back to the Early Iron Age, but also plant motifs, which is a rare occurrence in a historic tablet weave perspective. Special features in the find are closely connected to the choice of materials and techniques. That can be seen as an expression of the artistic design of both the weaving community and of individual weavers. Several bands are unique masterpieces, but 34D is the most varied, both in terms of motif and of weave techniques.

7 THE USE OF SILK IN THE VIKING AGE BOAT GRAVES FROM VALSGÄRDE

Author(s): Bengtsson, Marie (Department of Art History, Uppsala University)

Presentation Format: Oral

This paper presents results from my research project on the grave textiles from Valsgärde – an Iron Age boat cemetery in Uppland, Sweden. After a renewed analysis of the artifacts retrieved from the excavations it is now clear that the fifteen boat graves of the site contained a larger amount of preserved textile than previously thought. In addition, based on the find materials, it is possible to note a change in the furnishing of the burial rooms taking place around 700–800 A.D. The weapon rich interior and bed textiles of wool and linen are replaced and instead luxurious silk with silver embroidery, clothing and furnishing with decorations of silver posament and tablet woven trims in silk and silver appear together with a smaller number of weapons and shields. The wool and linen fragments appear now only in very small numbers as clothing and protective materials around artifacts.

In this presentation, I will mainly focus on the use of silk in the boat grave burial rooms and discuss the different types of silk that have been identified.

8 PILLOWS AND MATTRESSES IN SCANDINAVIAN VIKING AGE GRAVE FINDS

Author(s): Rimstad, Charlotte - Mannering, Ulla (National Museum of Denmark)

Presentation Format: Oral

In several Scandinavian Viking Age graves, remains of pillows and mattresses have been recorded. Particularly in the rich male burial from Mammen in Denmark, both an almost fully preserved blue coloured pillow and thick layers of feathers, probably belonging to a mattress, were found. Similar layers of feathers have been recorded in several rich female graves, e.g. in Hvilehøj in Denmark and Oseberg in Norway. What kind of grave furnishing do they come from? Was death seen as the eternal sleep and can the grave furnishing tell us anything about the use of mattresses and pillows for the living? The paper presents the latest analyses of the furnishing textiles found in the Mammen and Hvilehøj burials which are current being studied within the scope of the Danish Fashioning the Viking Age project at the National Museum of Denmark. By making reconstructions of different textile qualities with different kinds of reconstructed tools, the project seeks to emphasize the great variation of the Viking Age textile production which was not only essential for the making of clothes, but also for sails and household textiles.

156 CRAFTING FOR THE USER: THE INTERSECTION OF DAILY LIFE AND OBJECT-MAKING

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Miller Bonney, Emily (California State University Fullerton) - Adams, Sophia (Later Prehistoric Finds Group, University of Glasgow)

Format: Session with presentation of 6 slides in 6 minutes

In sessions during the last two EAA conferences the present organizers examined issues of crafting and in particular cross-crafting. How were techniques and forms typical of one medium incorporated in products in other materials? Were lines between crafts neatly drawn, or is craft-specialization more illusory than the literature often suggests? Focused primarily on means of making these discussions took the perspective of the crafter and involved speculation on use as a secondary consideration. In this session focus shifts to the point of view of the user and how the crafters' decisions figured in the consumers' practice. The organizers are particularly interested in how users may have deployed object and materials to support strategies of social or political change in and through space: e.g., growing communities, expanding territorial reach; reshaping the built environment. The interaction with the individual object is metonymic of people's engagement with the landscape directed at pushing social boundaries. Crafters participated in this dynamic by thinking through these goals in material and making choices, some intended to make a statement perhaps about power and others directed at eliciting an emotive response. But the manufacture on its own was insufficient to achieve any purpose and the user's agency was critical to the process in question. A brooch must be worn or displayed in a particular manner and a pot must fulfill a particular function if either is to communicate the intended message. In the format chosen for this session - six minute papers with no more than six slides - participants are invited to reflect on the material and immaterial ends to which crafted objects were directed and what these aims reveal about how users employed objects to articulate cultural values.

ABSTRACTS

1 SEPARATING THE INSEPARABLE? THE MAKER AND USER OF LATER PREHISTORIC TOOLS

Author(s): Adams, Sophia (University of Glasgow; Later Prehistoric Finds Group)

Presentation Format: Oral

When recording collections of archaeological artefacts, we categorise them into familiar groups: tools, weapons, fixtures and fittings, ornaments and so on. In so doing the implication is that the form of the object is synonymous with its function. Aside from the issues inherent in such simplistic interpretations it also glosses over whether the object was made to be an intended type of item and whether it was used in this way and by whom. We seem to understand the complex uses of items of weaponry for causing injury, for display, for promoting messages of power or status or skill. But when it comes to tools, we are far less discursive on the point; except in the possibility that a tool for having an impact on an inert material could also function as a weapon on an animate being.

In this short presentation I want to focus on the toolmakers and the making of tools for makers. I will work to my strengths and concentrate on the metal tools and tools of metallurgy: adzes, axes chisels, crucibles, gouges, hammers, moulds, tongs... Is there any evidence that indicates a separation between the creator maker and the user maker? If yes is this widespread? If no, what does that mean? Through these examples I aim to set the scene for our group discussion on the intersection of the goals and choices of the maker and the agency of the user.

2 WOOD REFLECTED ON THE MIRROR OF CERAMICS: LOOKING FOR MISSING IRON AGE WOODEN VESSELS OF NORTHWEST IBERIA

Author(s): Martin Seijo, Maria - Seoane Novo, Cristina - Rey Castiñeira, Josefa (Universidade de Santiago de Compostela)

Presentation Format: Oral

Wood rapidly perishes in archaeological contexts and the vast majority of objects made in this raw material are missing. But, could we recover evidences of wooden recipients through the analysis of ceramics? In Northwest Iberia during Iron Age wares are mostly composed by closed recipients that have been used for storing and cooking. Whilst open recipients such as buckets, tankards, platters, cups, bowls and scoops used for serving and consuming food and drink are missing. These latter recipients, as well as lids and stoppers were probably made of wood or cork and have been mostly vanished in the archaeological record. But several of their features could be reflected on ceramics, such as techniques, surfaces, decoration and forms typical of wooden vessels. Material choices could be related to technological innovations but also with social customs of drink and food consumption in the case of wooden recipients. A specific ceramic type has been selected to reflect on the relation established between wood and ceramic crafts: the cylindrical ceramic vessels identified in the Miño Basin which are probably emulating stave-built and carved containers.

3 CRAFTING AND MARKETING IN NEOPALATIAL CRETE: THE TALISMANIC SEALS AS A VEHICLE OF SOCIAL IDEAS

Author(s): Morda, Barbara (University of Kent)

Presentation Format: Oral

Craft specialisation is an important activity and it has been the topic of much discussion among anthropologists and archaeologists. Through this activity, different types of artefact are created, each one with a particular purpose (e.g. utilitarian or luxurious) depending on social needs.

Once artefacts are produced, they circulate through the activity of the market and, finally, are consumed by users. Thus, craft specialisation, market and consumption are intersected activities and representative of a powerful agency. The social agents that perform these activities may be related to specific social structures such as a state and, consequently the method of production and the use of specific artefacts may have been chosen to support socio-political strategies and to communicate cultural values, constructing territorial and social boundaries.

The Minoan talismanic seals are a large group of homogeneous artefacts defined by shape, specific materials, engraving technique, style and chronology. This paper discusses how specific cultural and, potentially, political ideas may have been constructed through their production. The analysis emphasises the role of the craftsmen and examines how these ideas were territorially disseminated. This study of the market and consumption of the talismanic seals raises new questions about the general political configuration of Crete during this complex phase.

4 CRAFTING FOR THE USER: IVORY AS GROUP OR SOCIAL MARKER IN THE CHALCOLITHIC SITE OF VALENCINA DE LA CONCEPCION (SEVILLA)

Author(s): Lucíañez Triviño, Miriam (Institute of Prehistory and Archeology of the Middle Ages, Eberhard-Karls-University of Tübingen; Department of Geography, Prehistory and Archaeology, University of the Basque Country - UPV-EHU)

Presentation Format: Oral

Throughout its history, each society, or group, has used different raw materials and objects to support strategies of socio-politi-

cal reaffirmation or change. These raw materials have not always had the same value or meaning and this depends absolutely on the cultural value conferred by the society that consumes them. However, it seems that ivory has always enjoyed great esteem in the social and cultural spheres. Used in Iberian Copper Age in funerary/ritual context, it has been recurrently used as an expression of wealth and status to support strategies of social reaffirmation. We find an early example of this in the Chalcolithic site of Valencina de la Concepción (Seville, Spain).

Valencina stands out with almost 8.8 kg of ivory, surpassing, so far, the weight of any other Iberian chalcolithic site. The main consumption context (91% of the artifacts) is the funerary/ritual, and no tools manufactured in this material have been found. In contrast, Valencina ivory artifacts have a close relationship with personal (beads, combs, rings, pendants) and objects ornamentation (cylindrical containers, boxes, perforated disks, handles, plates, lids, containers mouths), and except for minimum coincidences, each tomb has a unique "batch" of pieces. This suggests that the objects were not manufactured in serie, but perhaps in a personalized way, oriented to a particular type of consumers (prominent people or with ambitions to stand out within a certain society or group?).

This paper will highlight the role of ivory in the Chalcolithic site of Valencina, as a marker or social differentiator (unique pieces), and its use (fragmentation and redistribution of pieces) as a tool to perpetuate union with the ancestors or with a previous prominent lineage, as a way of sustaining unions with other people, living or dead, and reinforce the feeling of belonging or identity.

5 **WROUGHT, WORN, WRAPPED: THE BIOGRAPHY OF IRON AGE BROOCHES FROM POCKLINGTON, EAST YORKSHIRE**

Author(s): Giles, Melanie (Archaeology, School of Arts, Languages and Cultures) - Adams, Sophia (University of Glasgow)

Presentation Format: Oral

The discovery of numerous new 'Arras' square barrow burials at the edge of the Yorkshire Wolds in the UK has renewed interest in this chariot-loving community who buried their dead with great icons of British 'Celtic' art – swords, shields, necklaces and mirrors. Here we present the story of three small brooches: composites of bronze and iron, with red glass and coral beads. Uniquely, these brooches bear moulded or pinned elements which create characterful zoomorphic faces and bodies. In order to make sense of these diminutive, charming yet symbolically powerful objects, this paper reports on the reproduction of three replicas... a collaboration between archaeologists, smiths, glassworkers, osteologists and faunal experts. By discussing not only their making but wearing and handling, we hope to conjure something of Stuart Piggott's evocation of the 'exuberance of sheer pleasure in elegance' (1992: 68) in the smallest of well-crafted objects, and how this played a particular importance in their final role as grave goods and shroud pins.

6 **GOLDEN IMITATIONS OF ROMAN COINS – SYMBOLS OF POWER?**

Author(s): Pilekic, Marjanko (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

Like many other products, Roman coins were exported far beyond of the borders of the Roman Empire. There they entered a new sphere of economic and social interactions. Later they were also imitated in significant numbers. Until the mid-3rd century primarily silver denarii were copied, which remained in a primarily economic sphere of economic transactions. Later, gold coins were also imitated and were to a large extent removed from the monetary sphere.

I am studying the imitations of Roman coins from "the Central European barbaricum" between the 4th and 6th centuries A.D. with a focus on imitations in gold. The majority of these imitations were directly removed from monetary circulation by piercing or looping – or in some cases produced in this way – and thus never went into monetary circulation, suggesting that these pieces took on a whole new meaning. Comparable to jewellery, these coins could be worn on the body, on clothing as part of the costume or as decoration on weapons and equipment, whereby the possible symbolic significance for the wearer or wearers and the effect on the outside should not be underestimated. For in almost all cases the holes or loops have been set in such a way that the front, and thus the portrait of the Roman emperor, was displayed. Such imitations of Roman coins, which were presumably produced by the developing elites right across the north of the Roman frontier and used by them to demonstrate their status provide an insight of this cultural meeting, a synthesis of Roman and indigenous societies. In my contribution I would like to present some material that looks like money in coin form – and was quite sure manufactured like genuine roman coins – but underwent a transformation in meaning.

7 **NORWEGIAN GOLD: MATERIAL DYNAMICS IN THE MIDST OF CRAFTERS AND ELITES**

Author(s): Amundsen, Marie (Department of Archaeology, Conservation and History, University of Oslo)

Presentation Format: Oral

The background for this paper is a study of gold in southern Norway. It stretches through a time period of four centuries and two archaeological periods, the Migration Period (c. 400–550/60) and the Merovingian Period (c. 550/60–800 AD). Looking at the larger trends in the archaeological record, the presence of gold in these periods went through radical changes. For most of the Migration Period gold is plentiful and mostly found in rich burials as jewellery. During the first half of the 6th century AD however, there seems to be several depositions of gold hoards. By the start of the Merovingian Period many archaeological sources, such as gold, perish from archaeological contexts, and it seems like much knowledge of craftship and technology outright disappears. When it comes to gold, it has been pointed out that this 'disappearance' is probably due to external factors such as the

gradual fall of the Western Roman Empire and the 'dust-veil event' of 536/37. Thus, in the Merovingian Period gold is very rare. When found it is often in the shape of small gold foil figures, usually at settlements with a centre-function.

Events overarching both crafters and consumers resulting to limited access to a specific material, and the responses to such events, here seen in the clear shift of contexts where gold is present, makes a backdrop for this paper. The ways in which gold was used as part of the social and economic strategies of the elite drastically changed throughout this time, and so did the knowledge of crafters working with gold as part of the elites strategies. Within this backdrop I wish to explore and reflect upon the dynamics and interaction between elites, crafters, and the access to gold within this very distinct historical context.

8 HE WHO PAYS THE PIPER, CALLS THE TUNE? - THE BIRTH OF THE ESTONIAN GLASS INDUSTRY

Author(s): Reppo, Monika (University of Tartu)

Presentation Format: Oral

During the reconstruction of Haapsalu Episcopal Castle, a 17th century cesspit containing a selection of glass finds was discovered. This discovery proved a vital link in connecting the first known Estonian glass factory, Hüti (1628-1664) to its owners, the De la Gardie family through archaeology. The family owned large estates and built churches and manor houses which still bear testament to their social status and role in local and state affairs but their connection to the factory was previously only possible to study on paper. Through written records, we know that the De la Gardies rarely visited the factory but they were instrumental in making glass a wide-spread commodity in Estonia which had previously relied on imported glass. This paper looks at how the needs and demands of the De la Gardie family, the owners but also the largest consumers of the factory, influenced the artistic freedom of the glass masters at Hüti.

9 CONCEALING CRAFTING AS A MESSAGE TO THE USER

Author(s): Miller Bonney, Emily (California State University Fullerton)

Presentation Format: Oral

Scholars frequently point to the high quality of craftsmanship in a particular object or class of objects as evidence for specialization. Presumably the skill set of the artisan who made the blade of an inlaid Minoan dagger was different from that of the hand responsible for the intricate niello inlay. Luxury objects acquired value from both the investment of the material but also the amount of labor - in this instance the work of two crafters - who produced the object. The art of Minoan Crete in both the Protopalatial and the Neopalatial phases (roughly 1900 BCE to 1400 BCE) is replete with labor-intensive pottery, seals, frescoes and other objects. Display and use reinforced the elite status of the fortunate few.

This brief paper looks at a category of objects in which, it is argued, a quite different message was intended. Every bit as much a part of Minoan palatial life as the luxury goods, the conical cup by contrast was a homely item - undecorated, often irregular in profile. Manufactured by the thousands, they played a crucial role in palatial ritual feasts. As a product of a ceramic production that could produce eggshell ware and the complex patterns of Kamares pottery the artlessness of the conical cups seems from a different world. Did the makers of the cups intentionally conceal the crafting involved in their manufacture? Was this apparent "craftlessness" intended to convey to their users a message about their status in the larger social fabric? This paper raises the larger question about the techniques crafters used to convey social messages and concludes our session by reflecting on crafting as messaging.

157 AT THE FRINGE OF EARLY NEOLITHISATION - FROM THE COASTS TO THE MOUNTAINS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Ebersbach, Renate (Landesamt für Denkmalpflege Baden-Württemberg) - Antolin, Ferran (IPNA Universität Basel) - Hofmann, Daniela (Universität Hamburg, Institut für Vor- und Frühgeschichtliche Archäologie)

Format: Regular session

The long-critiqued dichotomy between Mesolithic and Neolithic lifeways hides a vast range of adaptations, transitional and mixed economies, and alternative regional trajectories. However, these remain poorly characterised, both terminologically and from an economic and social point of view.

In this session, we focus on this muddy middle part of the scale, particularly in contexts in which an adaptation of various and potentially quite diverse 'Neolithic economic packages' to new kinds of environments was needed (e.g. to a coastal or mountainous habitat). Such challenges required considerable economic and social adaptation and creativity. In particular, we want to ask:

- Was Neolithisation rapid or slow, and in which circumstances were different paces achieved?
- How durable and intensive were these new economic patterns?
- How can we trace them archaeologically? For instance, what would these look like in the on-site and off-site records, or in terms of plant macroremains?
- What are the preservation potentials in different regions? Are 'incomplete Neolithic packages' due to such taphonomic factors, or to a genuine diversity in adaptations?
- Was there a predictable sequence of adaptive steps, following logically from each other, or is there diversity? Are our chronologies at a high enough resolution to distinguish between alternative scenarios, especially were the spread is rapid (e.g. coastal colonisation)?

- Are such transformations the result of farming populations adapting their economy to a new environment, of forager populations extending their resource base, or a mixture of the two? How can we label such mixed formations?
- In how far did social formations change as a result of economic adaptations?

The aim is to compare scenarios from many different regions in order to characterise the complexity of these 'mixed forms' more precisely and to differentiate between alternative explanatory models. We therefore invite contributions from all geographical regions.

ABSTRACTS

1 TAKE A WALK ON THE WILD SIDE – MODELS OF LIFE AT THE FRINGES OF EARLY NEOLITHISATION

Author(s): Hofmann, Daniela (University of Bergen) - Ebersbach, Renate - Antolin, Ferran (IPNA Basel)

Presentation Format: Oral

You are either a hunter-gatherer or a farmer. Once the initial excitement of the Mesolithic-Neolithic transition is over, and the first evidence of a fully agricultural economy has been identified, then a predictable path is set. Or is it? Over the last decades, archaeologists have increasingly come up against societies who do not seem to fit easily to such labels, and who practise a vast range of mixed economies. This sort of evidence is often found at the margins of 'core' Neolithisation areas and in the interstices between Neolithisation routes. There are also many situations in which elements of agriculture or animal husbandry are being adapted to a suite of new environments, such as island settings, higher altitudes or new soil types. Mostly in such cases, especially where evidence of hunting, gathering and fishing is involved, our efforts remain centred on the question whether this adaptability is a sign of 'Mesolithic' involvement or not, leading to a quagmire of terminological confusion.

In this introductory paper, we would like to present some models for what may be happening when elements of agriculture and animal husbandry are adapted to new kinds of environment. This question is, on the one hand, methodological (accurate dating, identification of relevant behaviours, taphonomy, visibility in on- and off-site data and site categories...). But it is also a question of economy, and not least of social change. By offering a first comparative perspective, we hope to lay the foundations for discussion in the rest of the session.

2 THE PATTERNS OF NEOLITHIZATION IN THE REPUBLIC OF MACEDONIA

Author(s): Naumov, Goce (Center for Prehistoric Research / Museum of Macedonia)

Presentation Format: Oral

The Neolithization of Balkans was explained in different way, but many do agree that it was a process initiated by Anatolian communities that introduced new modes of living among indigenous foraging societies. But besides the numerous quantities of evolving data there are still debates on how this process was integrated from the coasts to the continental parts of the peninsula. Was it a rapid colonization or slow adaptive migration and were the social transformations made due to Anatolian linkages or new identities were established as result of interaction between newcomers and natives. For some of the Balkan countries there is a solid data that is used in an attempt to explain the chronological and economic frames of this agricultural process although many questions still emerge. But for others there is still scarcity of information that can firmly determine when and how the first farmers inhabited the region and were they integrating or putting aside the local foragers.

The research on Neolithic sites in the Republic of Macedonia has been more intensive in the last decade in spite of a big gap since 1970's when the most of the knowledge on Neolithization process was obtained. The recent studies provide new results on chronology, spatial patterns, agriculture, herding, economy, buildings, identity and rituals, but the gap of few decades has impact in the insubstantiality of the hypotheses for determining the initial stages of Neolithization and its advance in later phases. Nevertheless, some reliable data on temporal frames, demographic spread, social formations, economic preferences and iconographic norms could be provided and arguments for Neolithic process could be proposed as well.

3 THE KARST NEOLITHIC OF CAPUT ADRIAE: AN "INCOMPLETE NEOLITHIC PACKAGE" OR A SMART ADAPTIVE SOLUTION?

Author(s): Montagnari Kokelj, Manuela (University of Trieste) - Bernardini, Federico (Multidisciplinary Laboratory ICTP Trieste)

Presentation Format: Oral

One of the main routes of the spread of farming into Europe follows the eastern Adriatic coast as far north as the Caput Adriae, where the Karst is located: specific physiographic conditions, history of field research and of studies make the Neolithisation of this area similar but different from that of the surrounding ones.

In the Karst, since the first discovery of the Mesolithic in the Azzurra cave in the early 1960s, its presence has been detected in 18 cavities and 1 probable open-air site. The following Neolithic – named Vlaška Group, Danilo-Vlaška, Gruppo dei vasi a coppa – is recorded in 14 of these caves, but almost everywhere (with one possible significant exception at Edera cave) after a sedimentological/chronological gap.

14C dates are few but would indicate that the Neolithic started at around 5600-5500 BC and lasted for at least 1 millennium. Danilo-Vlaška materials – pottery, flaked blades and polished stone axes, faunal remains of domesticated animals (mostly ovi-

caprines) – are present in more than 40 caves in total, but in highly variable numbers, from one to many hundreds, presumably due to the nature of modern discovery (occasional findings vs. systematic excavations) on the one hand, and of ancient use on the other. Geo-archaeological studies have in fact demonstrated that many caves were used by shepherds with their flocks of sheep and goats for millennia, with variable intensity and continuity. Archaeometric analyses of polished stone artefacts have contributed to identifying the extent of their movements and to hypothesizing the exchange mechanisms involved, in which the availability of sea salt along the coast could have played an important role.

Under current paradigms, these data would suggest an “incomplete Neolithic package”, but an alternative interpretation would value the smart site-specific adaptation of human groups to Karst areas.

4 THE OVERLAPPING LAND USE STRATEGIES BETWEEN THE MESOLITHIC AND NEOLITHIC POPULATIONS IN THE LOWER DANUBE CATCHMENT?

Author(s): Hristova, Ivanka (Environmental Archaeology Lab, Umeå Universitet) - Marinova, Elena (Laboratory for Archaeobotany, State Office for Cultural Heritage Baden-Württemberg) - Ivanova, Maria (Institut für Ur-und Frühgeschichte und Vorderasiatische Archäologie, Universität Heidelberg)

Presentation Format: Oral

The archaeobotanical finds provide information not only on the plants consumed by the inhabitants of given site, but also on the natural habitats which were used by those people. The available evidence shows that the economy and nutrition strategies of the Neolithic farming population in the Lower Danube have certain elements in common with those of the Mesolithic hunter-fisher-gatherers, such as their affinity to aquatic resources. This may have been an adaptation to local environmental conditions, but can also indicate the survival of a Mesolithic cultural tradition in Neolithic practice. The evidence from plant macrofossil analyses and wood charcoal analyses from those areas point that the both the Mesolithic and Neolithic populations targeted open woodlands rich in fruits (like cornelian cherry, wild apple/pear, elder etc.) and also riparian forests and other aquatic resources (most prominent example the water chestnut). In the current contribution we present evaluation of the possible habitats used by Mesolithic and Neolithic populations in the areas of Banat, Iron Gates and Lower Danube plain in combination with the paleobotanical evidence. By incorporating this data in the overall picture for the natural and cultural developments in the period before and after the spread of farming in the Lower Danube catchment, we would like to critically evaluate the hypothesis for continuity of discontinuity of the Mesolithic subsistence and land use practices in this region.

5 LOESS UPLANDS VERSUS SANDY LOWLANDS. THE PATHS OF NEOLITHISATION IN SOUTHERN POLAND

Author(s): Nowak, Marek (Institute of Archaeology, Jagiellonian University, Kraków) - Zajac, Mirosław (Archaeological Museum in Kraków) - Zakrzeńska, Justyna (Institute of Archaeology, Jagiellonian University, Kraków)

Presentation Format: Oral

In popular opinion, southern Poland was a classical area of early Neolithic settlement which was rarely exploited, and even ignored, by Mesolithic communities. However, southern Poland is in fact an area of diverse landscapes. Loess uplands which constitute a considerable part of the region indeed remained basically unoccupied by Mesolithic hunter-gatherers, and these uplands became only settled by the first Neolithic farmers (Linear Band Pottery culture) in the third quarter of the sixth millennium BC. In other landscapes, however, primarily those similar to Lowland ones, numerous remains of Mesolithic occupation have been recorded, including late Mesolithic ones. Thanks to radiocarbon datings it is currently obvious that late Mesolithic societies continued to develop there at least until the mid-fifth millennium BC, simultaneously with ‘Linear’ and ‘post-Linear’ farmers. Anthropological and historical interpretations of possible relations between these two cultural formations are difficult. It is even more challenging to assess the role played by Mesolithic populations in the Neolithisation of southern Poland. In this presentation we will analyse the chronological, environmental, settlement, and typological data from the perspective of these problems. As a result, the probability of three basic hypotheses will be evaluated. These hypotheses assume that Mesolithic communities: (1) were passive witnesses of the Neolithisation; (2) provided an essential population substrate for this process; (3) underwent disintegration during its course.

6 THE FAR WEST: RE-VISITING FAUNAL AND PLANT ASSEMBLAGES FROM THE 6TH-5TH MILLENNIA BCE IN THE WESTERNMOST EDGES OF CONTINENTAL EUROPE

Author(s): Antolin, Ferran (IPAS, University of Basel) - López-Dóriga, Inés (Wessex Archaeology) - Martínez-Grau, Héctor (IPAS, University of Basel) - Sierra, Alejandro (Instituto de Investigación en Ciencias Ambientales - IUCA, Universidad de Zaragoza) - Saña, Maria (Dept. Prehistòria, Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Iberian Peninsula has been a geographically key area in multiple times across human history. Its ideal location close to the African continent as well as its remoteness in comparison to the rest of Europe have allowed interesting phenomena to take place, such as the latest evidence of Neanderthal presence in the continent. The neolithisation process, being a clear east-west directed expansion of farming populations offers an ideal scenario to test the resilience of already-existing hunter-gatherer populations in this part of the World. In order to discuss this issue we want to re-visit the archaeozoological and archaeobotanical records of the 6th millennium and 5th millennium cal. BCE, together with available radiocarbon dates on both types of material to observe the potential dynamics of assimilation, acculturation, interaction or marginalisation of the different groups. We believe

this type of evidence is key to understand economic change and resilience during this time period.

7 CONTINENTAL EXTENSIONS OF MEDITERRANEAN NEOLITHISATION

Author(s): Manen, Claire - Bouby, Laurent (CNRS) - Bréhard, Stéphanie (MNHN) - Perrin, Thomas - Vigne, Jean-Denis (CNRS)

Presentation Format: Oral

The Mediterranean neolithisation process is known to be a complex and polymorph phenomenon with a large variety of exploited environments, diversified economic resources and regionalisation process identified by the high variability in time and space of ceramic styles... The aim of this paper is to discuss the emergence dynamics of the Neolithic process in the southwestern part of France based on new data obtained in the PROCOME project funded by the French National Agency of Research. The PROCOME Project dealt with the conditions surrounding the emergence and the evolution of agro-pastoral societies during the 6th millennium cal. BCE, especially in the hinterlands. Based on a renewed corpus of data and an interdisciplinary approach, this work allows us to consider two main issues in relation with the session "At the fringe of early Neolithisation – from the coasts to the mountains":

- The traditionally accepted model that human communities first settled in coastal areas is challenged by new high-precision chronology which allows us to also identify an early continental pathway.
- These new ecosystems were rapidly exploited, alongside a diversification of food acquisition systems, based on both domestic and wild resources.

Our goal is to discuss this variety of situations and to pay particular attention to the question of environmental and social dynamics involved in the Neolithisation process.

8 THE NEOLITHISATION OF THE WESTERN ALPS: A BIOARCHAEOLOGICAL POINT OF VIEW

Author(s): Martin, Lucie (Laboratory of Prehistoric Archaeology and Anthropology, University of Geneva; UMR 5204 EDYTEM, University of Savoie Mont-Blanc)

Presentation Format: Oral

The best known studies of the Neolithic plant economy of the Alpine region are from the pile-dwelling sites of the massif stretching from Lake Geneva to Lake Constance, and to a lesser extent in Northern Italy. However, the first lake and wetland villages did not appear until the Middle Neolithic, around 4400 cal. BC. The only existing data of the transition from the Mesolithic to the Neolithic therefore comes from open-air sites, shelters, or caves located in the pre-Alpine mountains and the internal Alps.

In recent years, archaeobotanical analyses from the Alps of Switzerland and Northern France have been carried out on occupations dating from 5300 to 4500 BC. New data is now available to fill a gap, both chronological and spatial, in this region by providing details of the plant exploitation of late hunter-gatherers and the first agropastoral communities.

This paper presents several recent case studies that allow us to renew our knowledge of the Mesolithic/Neolithic transition as well as the alpine neolithization process. What can archaeobotany tell us about the plant economy of the last hunter-gatherers and the first farmers? When and where did cultivated plants first appear? How can we characterize the subsistence economy of the first farmers? This presentation will also provide an opportunity to discuss the integration of other approaches and methods (eg: archaeozoology, charcoal analysis, and isotopic analyses) as a means for addressing the occupation of the Alps by the first farmers.

9 EARLY HUMAN IMPACT AND THE NEOLITHISATION IN THE ALPINE FORELANDS: NEW ON-SITE AND OFF-SITE DATA

Author(s): Ebersbach, Renate (Landesamt für Denkmalpflege Baden-Württemberg) - Wick, Lucia (IPNA Integrative Prähistorische und Naturwissenschaftliche Archäologie)

Presentation Format: Oral

Thirty years ago the seminal article by C. Erny-Rodmann, E. Gross-Klee and S. Jacomet on early human impact in Switzerland [Früher "human impact" und Ackerbau im Übergangsbereich Spätmesolithikum-Frühneolithikum im schweizerischen Mittelland, 1997] discussed off-site data of human impact as possible indications that Neolithic activities started much earlier than the famous pile dwellings. The following debate concentrated on the possibility of identifying Neolithisation processes with off-site data in the absence of archaeological on-site data.

Since then, huge survey projects, detailed excavations and many new off-site records with high-resolution analyses have added not only new data, but also new possibilities of merging on- and off-site archaeology, palynology, archaeobotany and geoarchaeology to investigate the transition phases of the 6th and 5th millennia BCE. They provide novel insights into causes and processes of major environmental changes occurring in this period, such as the mass expansion of beech or the elm and lime declines. We will present the new data in a chronological overview and discuss the explanatory power, representativeness and biases of both on- and off-site methods and data in understanding the Neolithisation process in the Alpine Forelands.

10 MIXED ECONOMIES FROM MUDDY CONTEXTS: THE SIGNIFICANCE OF TUNA (THUNNUS THYNNUS) IN EARLY NEOLITHIC SOUTH NORWAY

Author(s): Nielsen, Svein (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

There is an understanding – though sometimes unspoken - among scholars that all past inhabitants of Norway were dependent, in some way or another, on marine resources. From Early Mesolithic foragers to recent fisher-farmers, the sea has held significance economically, socially, and probably also spiritually. Due to a strong culture-historical research tradition in Scandinavia, this understanding has found an awkward position in Neolithic (3900-2350 cal BCE) knowledge production, which has had a tendency to suppress ideas of mixed (or muddy) economic orientations. This paper presents a bottom-up approach to the Early Neolithic in south Norway. Results from recent excavations at the wetland site Jortveit, Skagerrak coast (south Norway), enforces a revision of previous ideas concerning marine adaptation among early farming communities in this region. The discovery of large amounts of fish bones and osseous artefacts preserved inside a prehistoric seabed indicate a mixed economic orientation in the mid-4th millennium BC. The site suggests that seasonal mass killing of tuna (*Thunnus thynnus*) was an important communal tradition among early farming communities in the Skagerrak region. Other aspects of the Jortveit site indicate a cultural history connected to Neolithic groups in Central and Eastern Europe orientated towards 'wild' resources.

11 WHAT'S IN A NAME? LEAVING THE TERM 'NEOLITHIC' BEHIND TO BETTER EXPLORE SOCIETAL DEVELOPMENTS 4000-1800 BCE IN SOUTH NORWAY?

Author(s): Nyland, Astrid (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

In most of Europe, the term 'Neolithic' refers to the agricultural transition, comprising cultures with pottery, specific axe types, houses, crops and animal husbandry. In Norway, on the fringe of northern Europe, this is not necessarily the case. Some see the region as displaying only an 'artefactual' Neolithic, because of the varying presence of elements of the 'package'. Others argue that there was no Neolithic in Norway prior to c.2300 BC, since the transition to farming did not take place until then. Therefore, an impression of a 'true' Neolithic lingers, implying the existence of a process moving towards Neolithisation, with a society where agriculture was the economic subsistence base as a goal.

However, although the chronological period between c. 4000 and 1800 BC in Norway bears the name 'Neolithic', the dominant way of life was hunting, gathering, and fishing. If the name of the period set the premise for research on this period, should we instead abandon the name, and operate with only a chronological skeleton comprising of calibrated years BC to enable discussions of existing local and regional material culture across different regions? Is this perhaps a better point of departure for developing a new understanding of the various developing historical trajectories? Instead of operating as if something is lacking, i.e. 'Neolithic elements', developments should be acknowledged as depending on geographical location, social institutions and strategies, human preferences, and ontological understanding existing in parallel. Various Norwegian archaeological examples will be used to explore this issue.

A. AT THE FRINGE OF EARLY NEOLITHIZATION IN THE LOWER VOLGA REGION

Author(s): Vybornov, Alexander (Samara State University of Social Sciences and Education)

Presentation Format: Poster

The Lower Volga Region is located in the steppe and semi-desert zones. The features of the development of cultures were influenced by the specificity of the natural environment. Cattle breeding could not occur among the local population here: there was no wild sheep in the Lower Volga Region. According to archaeological data, the emergence of cattle breeding in this area is associated with the advent of a new culture. This is confirmed by new types of ceramics and the transition the stone industry. The natural specificity of the steppe and semi-desert regions was unsuitable for the development of farming. Thus, the full Neolithic package could not be formed in the Lower Volga Region. Initially (5300 BC), only sheep breeding is recorded in the Caspian culture. But it was not the dominant form of the economy: the bones of wild animals predominate. The number of monuments of the Caspian culture does not increase. There is no reason to assume a sharp demographic growth. It is not possible to consider this model to be intense. About 5000 BC, besides sheep, cattle appear in the materials of the Khvalynskaya culture of this region. The number of monuments is increasing. The number of artifacts is increasing. The remains of dwellings were found. This indicates a greater sedentary lifestyle than in earlier cultures. On the other hand, in contrast to earlier times, seasonal mobility of the population is recorded in semi-desert and steppe regions of the Lower Volga Region, over the period from 5200 to 4500 BC. It was because of changing periods of aridization and moisture and was a form of adaptation of pastoralists. Thus, the Lower Volga Region can be considered as a special eastern periphery of the neolithization centers with a mixed form of the model.

Project 33.1907.2017 / PCh.

CULTURE CONTACTS IN THE WESTERN MEDITERRANEAN SEA DURING THE ROMAN AGE. POTTERY AS CULTURAL MARKER BETWEEN TRAFFICS AND LOCAL PRODUCTIONS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Giuman, Marco (Università di Cagliari) - Poveda Navarro, Antonio (Universidad de Alicante) - Parodo, Ciro - De Luca, Gianna (Università di Cagliari)

Format: Regular session

The study of pottery of the ancient world is an important element to analyze the contacts and the transmissions of social and cultural models. By this way, in consideration of its geographical extension and the long process of its political, economic and socio-cultural hegemony, the Roman Age can be a privileged field of study in a research perspective, that aims to highlighting how and how much the dynamics of integration following the conquest are carried out, also through the commercialization of pottery classes and uses of some vessel shapes. In fact, this latter topic can constitute an important way to demonstrate the possible relations between the diffusion of specific vessel shapes and the transmission of Roman traditions and symbolic customs, in the geographical area object of this investigation.

Given these premises, the so-called local productions also play a key role in this work of interpretation of the pottery material culture, because they are inspired by the great Mediterranean circulation and represent a focal point for understanding, in a primarily comparative perspective, the different degree of penetration of the Roman integration processes, in different social and geographical contexts. For example, the selection of ceramic forms can reflect the spread of cultural models, as in the case of those that seem to be directly linked to food trends. Therefore, in the comparison of the various contexts proposed, this study could make a significant contribution to a coherent reconstruction of these kinds of phenomena. In fact, this approach in the study of material culture can be workable to the analysis of the models of 'Romanity'. It will be important to highlight the role and importance of local productions as phenomena that could be the expression of reception and re-elaboration of Roman cultural models in a diachronic perspective.

ABSTRACTS

1 INTRODUCTION TO THE SESSION: POTTERY AND CULTURAL LINKS DURING THE ROMAN AGE. SOME QUESTIONS AND SOME METHODOLOGICAL PREMISES

Author(s): Giuman, Marco - De Luca, Gianna (Università di Cagliari)

Presentation Format: Oral

The study of pottery, in a hermeneutical perspective that today is strictly linked to an interdisciplinary approach, has always been a fundamental element for the reconstruction of many important aspects of the ancient world. Pottery is an instrument capable of conveying complex messages regarding the social status of users, but also an essential element in daily life, in the conservation and transport of food and goods, as well as performing ritual functions. In fact, it can provide decisive answers to the interpretation of many aspects of the ancient world. A careful comparative analysis, helped in recent decades by the use of archaeometric techniques, allows us to obtain increasingly accurate information on the macro-economy of the ancient world, on its domestic economy, on trade and on the evolution of its social structure. Given these general premises, it is precisely in this perspective that ceramics constitute a fundamental marker in the recognition and evaluation of the mechanisms of cultural interaction. This is obviously no exception to the Roman world. Here, the political-military expansion is constantly accompanied by the spread of ceramic classes whose acquisition, in different geographical contexts, is diversified by time and manner depending on multiple factors. These can be, for example, the different pre-existing cultural substrates at the Romans came, the different social level, the complex phenomena linked to the change of taste, the sequence of fashions and the needs of a commercial nature. This session therefore aims on the one hand to implement knowledge about these issues through the acquisition of new data and contexts, and on the other hand to identify, as far as possible, the existence of common dynamics capable to reconstruct a model in which periphery and center can be recognized as different parts of a single cultural system.

2 THE CULTURAL IDENTITY IN ROMAN WARES

Author(s): Di Giuseppe, Helga (Associazione Internazionale di Archeologia Classica)

Presentation Format: Oral

Ceramics is an irreversible material and for this reason it is one of the few indicators able to tell us stories of everyday life that escape the narratives of ancient authors. With pottery we can make economic, social, religious, but also anthropological history. It is the main tool for cooking and eating food and its shapes are the result of a series of factors related to time, place of production, knowledge of the craftsman and the values shared by the group of origin. The forms are also closely linked to the functions and food traditions of the people who have used them. Therefore, studying the ceramic material, and especially its diffusion and composition, is also an instrument to follow the stages of the movements of individuals from one part of the Mediterranean to another and from one part and another of ancient Italy. We will see through a series of cases chosen from the common and late republican and late antique ceramics of various regions of Italy in which way we can trace the presence of ethnic groups in places far from their origins and the reasons underlying these presences.

3 LOCAL PRODUCTIONS IN CENTRAL CISALPINE DURING THE MID-ROMAN PERIOD. COMPARING NEW DATA FROM REFERENCE SITES

Author(s): Palmieri, Lilia (University of Milan)

Presentation Format: Oral

In the last thirty years the archaeological excavations carried out in major centres and minor sites of the Cisalpine area collected lots of data on Roman pottery in Northern Italy. The findings significantly contribute to the definition of the socio-economic changes which involved this area during the Roman period and provide a valuable information on the production and exchange networks developed over the centuries. Nevertheless, the general framework is still fragmentary, in particular for local productions.

In the Roman site of Calvatone-Bedriacum (Cr), where the University of Milan has been working for more than thirty years, a significant local production has been isolated, which is a coarse ware bowl with peculiar typological and technological characteristics, identified as an indicator of the production areas of the site during the mid-Roman period. Because of its important and unusual role of chronological and functional marker within the Roman vicus and because of its relevance, due to its heavy presence and its close link with some distinctive areas and activities, this peculiar coarse ware vessel was defined "Calvatone bowl".

The paper will focus on the analysis of the "Calvatone bowl" as a cultural marker of the mid-Roman period (2nd-3rd centuries AD), with the aim of including it within the framework of the local productions of the central Cisalpine area by comparing it with coarse ware from reference sites recently investigated (Como, Milan, Brescia, Cremona).

4 EASTERN IMPORTS IN ROMAN TIMES IN THE MARCHE REGION (ITALY)

Author(s): Di Michele, Dario (Independent researcher)

Presentation Format: Oral

The study of the materials coming from the territory of Mondolfo (Marche region, Italy) provided further data for the knowledge of local and imported ceramics into the ager Gallicus. The data can be compared with those of Suasa, a Roman city in the Cesano valley, and other contexts of the Middle-Adriatic area. In fact, all the classes in the area are represented, such as the local gray pottery produced in the first years of Romanization (first half of the 3rd century B.C.), Black Gloss Ware, both local and imported, Gray Impasto Ware, Thin Walled Pottery, also of local production, Italian and Middle Adriatic Sigillata and African Red Slip Ware. However, there are also novelties with regard to the trade of amphorae and coarse wares from the Levantine area but also from the coasts of the eastern Adriatic. This work tries to demonstrate that, during the roman age, the Marche region were linked to the maritime traffics as much as the other Italian Adriatic coasts.

5 CERAMIC ARTEFACTS OF LOCAL PRODUCTION BY THE ROMAN MUNICIPE OF URVINUM HORTENSE (PERUGIA-ITALY)

Author(s): Cecconi, Niccolò (Università degli Studi di Perugia)

Presentation Format: Oral

The Roman Municipium of Urvinum Hortense is situated in Umbria, south of Perugia and represents one of the most important archaeological site in Central Italy during the middle Empire Age.

Amazingly, in subsequent centuries the site of Urvinum Hortense has never been developed or substantially occupied. As such, the site provides a unique opportunity to study the preserved monuments, the stratigraphy and the artefacts.

With regard to the material culture a considerable number of ceramic artefacts, both imported material and local production have been found during twelve Archaeological investigation. Among these objects, a type of fine ware realized with yellow purified clay extracted from the bedrock of the hill is particularly significant.

The aim of this paper is to examine this class of objects. The results could provide useful information on:

- Typological listing of artefacts realized with the local clay.
- The numerical and percentage distribution of these objects in the investigated sectors of the Roman Municipium.
- The chronology of the production.
- The exploitation of clay from the hill.

6 MADE IN CUMAE. LOCAL PRODUCTION, GLOBAL DISTRIBUZION

Author(s): Giglio, Marco (Università degli Studi di Napoli L'Orientale)

Presentation Format: Oral

Between 2004 and 2006 in Cuma was identified a stadium, which was built during the second century BC; the stadium was built against or overlapping the inner side of the fortifications. The building was abandoned early, covered by a deposit, consisting almost entirely of ceramic production waste (thin-walled pottery, common ware and Pompeian red ware).

The deposit was made not only of pottery, but also tools (including at least two spacers), structural elements of kilns and possible raw materials related to the processing of pottery.

Among the materials produced, the largest number has been the common ware (pans and lids); a flegrean production of common wares well known in the bibliography, for which however a precise localization has never been identified. In the case of Pompeian

red ware the production area was placed in both the flegrean and the vesuvian area. In reference to Cumae, Pucci identified with Pompeian red ware the cumanae testae or cumanae patellae - patinae mentioned in the sources.

The context is homogeneous and chronologically defined between the Augustan and the Tiberian age.

The presence of products from Cumae in many sites of Northern Europe, as well of the French and Spanish coast or Adriatic areas, often stamped by producers known also in Cumae (Marii and Helvii) is an interesting clue to understand the circulation and diffusion systems of local products in a international framework.

The contribution is focused on the local production of Cumae and an analysis of the circulation in other sites, with reference to both productive, typological and finally chronological aspects.

7 PUNIC BLACK GLAZED POTTERY FROM SARDINIA: A IMITATION CLASS BETWEEN PUNIC AND ROMAN PERIODS

Author(s): Del Vais, Carla (Università di Cagliari)

Presentation Format: Oral

Punic black glazed pottery is one of the most widespread imitation classes in Sardinia; it's mostly documented during the 3rd sec. B.C. in all areas controlled by the Carthaginians, but it continues to be produced in the Roman age until the early decades of the 2nd century BC.

This pottery is characterized by clay body generally not well purified and rich in temper, of variable color, more often grey, beige, brownish or orange. The glaze is not uniform and varies from black to gray, from brown to reddish; it is applied by immersion inside and on the upper part of the external surface. The most common forms are derived from Attic black-glazed pottery, but in the later stages of production forms derived from Campanian classes appear. The production ends with the arrival in the island of large quantities of pottery from Campania (classes A and B) which saturate the market with better quality products.

Sardinian production is portion of a more general phenomenon of Mediterranean Punic culture that is part of a very large geographical area that affects, in addition to Sardinia, North Africa, the Iberian Peninsula and only episodically Sicily. The beginning of this phenomenon is linked to the disappearance in the central-western Mediterranean at the end of the 4th century of massive imports of Attic ceramics, which replaces in the local market.

These ceramics show variable macroscopic features and at the same time common to the different diffusion areas. The archaeological investigations suggest that they are mostly local productions, connected to the common ceramic factories, but some analyzes carried out on Sardinian pottery have shown a much more complex situation related to import phenomena from North Africa. It is evident that a macroscopic analysis alone can not be enough to identify the different productions.

8 THE USE OF OLLAE PERFORATAE IN CAGLIARI (SARDINIA, ITALY) AND THE GARDEN AS A MARKER OF THE ROMAN CULTURE

Author(s): Parodo, Ciro (University of Cagliari)

Presentation Format: Oral

During 2014-2015 archaeological excavations in Cagliari (south Sardinia, Italy), a singular alignment of eight ceramic pots with perforated bottom was found along the walls of a rectangular room of a building used from the Late Republican Age until at least the Late Antiquity. These ceramic pots, dated to the first half of the 1st century CE, have been interpreted as ollae perforatae. According to the agricultural manuals written by Theophrastus, Cato the Elder and Palladius, these artifacts, which came especially from Campania, were perforated planting-pots employed in the Roman arboriculture and horticulture in order to make gardens, in both domestic and religious architecture. These pots often had one or more intentional holes on side or base so that the roots of trees and flowering shrubs could be planted in the soil.

Some of the earthenware pots discovered in Cagliari are characterized by the same morphological and typological features of the ollae perforatae coming from Pompeii and, like these artifacts, even the Sardinian ones contained soil fertilized by rests of shells and sea urchins spines. The presence of these perforated planting-pots in Cagliari could prove the existence of a garden in a residential area where rich thermal baths were built and decorated with sculptures of deities.

The aim of this paper is to demonstrate how these ollae perforatae represent an efficacious marker of the so-called Roman acculturation processes, expressed also through the building of thermal baths and gardens, two typical means of diffusion of the Roman culture.

9 COUNTING THE PIECES: A QUANTITATIVE APPROACH TO CULTURAL CHANGES FROM ROMAN KARALES (SARDINIA, ITALY)

Author(s): D'Orlando, Dario (Dipartimento di Lettere, Lingue e Beni culturali - Università degli studi di Cagliari)

Presentation Format: Oral

A single urban excavation can't allow archaeologist to understand large portions of an ancient city because of its usual small extension. For this reason a good way to get all the data from a small scale dig is to analyse and understand archaeological finds from different perspectives. An interesting approach to understand trade and cultural changes can be found in quantitative analysis. Counting archaeological finds can be made in a lot of different ways but a common method is to calculate the percentage of MNI of pottery sherds per decades to trace frequencies graphics (E. Fentress et alii 2004: Accounting for ARS: fineware

and sites in Sicily and Africa). Peaks and low points can be used to explain commercial trade but also to define related cultural changes. Comparing results of amphorae with fine-ware sherds – of both local and imported production –, historical-political shifting can be traced, checking how cultural changes influence, or get influenced by, material culture in the context of the *caput provinciae* of Roman Sardinia.

10 HELLENISTIC BLACK-GLOSS WARE FROM SARDINIA: CONTINUITY AND INNOVATION

Author(s): De Luca, Gianna (Università di Cagliari) - Tronchetti, Carlo (Retired, formerly National Archaeological Museum of Cagliari)

Presentation Format: Oral

Studies on black-gloss ware developed in Sardinia in recent years show, more and more precisely, that local productions are often the most attested classes. Starting substantially from the third century BC, continuing towards the late Republican age to reach the imperial age, occurs in different areas of Sardinia the presence of artifacts that intend to replicate or sometimes just resemble the black-gloss, suggesting the possibility of interpreting this phenomenon as an obvious and repeated attempt to establish a relationship of cultural proximity with a 'dominant' fashion. As regards the black-gloss ware in this specific case, this attempt is declined as an instrument of cultural mediation and social and economic interaction. Starting from these premises, this work intends to present some case studies that mainly refer to southern Sardinia trying to clarify some aspects around the times and problems related to local ceramic production and consequently to the selection mechanisms for the local premises, which determine the use and value of the containers.

11 THE TASTE OF ROMANITY. INNOVATION IN CULINARY PRACTICES IN NORA BETWEEN THE 1ST CENTURY BC AND THE 2ND CENTURY AD

Author(s): Giannattasio, Bianca Maria - Pallecchi, Silvia (Università degli Studi di Genova)

Presentation Format: Oral

Nora is a town with a long story and a complex cultural tradition that, in its first centuries, appears to be strictly linked to the customs and practices of the Punic world.

This tradition, favoured also by the geographic position on the Mediterranean Sea, can be easily found in the culinary practices, as testified by kitchenware and food preparation pottery shapes used between the 4th century BC and 2nd century BC.

As it happened in the construction of imposing buildings of the town, also in the practices of everyday life, innovations coming from the Roman culture is progressive and particularly slow and the spreading of the new tendencies lives together with the persistence of the Punic underlayers.

Markers of these changes are visible in the private and public life, where the adoption of codified forms used for the self-representation is evident (for instance in buildings and in the tableware pottery). Other markers, certainly less obvious but as much as important and even more substantial, demonstrate the deep rootedness of some Roman habits, that merge with the local traditions, regardless the exterior appearances of the self-representation.

Amongst these last markers, there is the use of some pottery shapes, that clearly shows a change in the taste of preparing and cooking food. The spreading of these changes in the local culture in Nora is also showed by the diffusion of various imitation products.

12 ACROSS THE SEA: CULTURAL INTERACTIONS IN SARDINIA BETWEEN IMPORTED AND LOCAL COARSE AND COOKING WARES IN MIDDLE AND LATE ANTIQUITY

Author(s): Carboni, Romina - Cruccas, Emiliano - Napolitano, Miriam (Università di Cagliari)

Presentation Format: Oral

The local production and importation of coarse and cooking wares in the Mediterranean, between the middle imperial age and late antiquity, has always been a stimulating field of archeological study. Being a complex period marked by changes and transformations, scholars have attempted to understand the cultural dynamics of this geographical basin. Sardinia is located in the middle of these trade among the North Africa, Hispania, Italy, Pantelleria and Eastern Mediterranean area and it has been marked by continuous and constant interactions between local and allogeneic elements. The island represents an exemplary case study to decode these aspects as attested by the findings, especially pottery, in some archaeological contexts of the southern area of the region. This study aims to outline the main elements that help to define the relationship between local production and imports, in light of cultural and political events that characterised Sardinia between the third and eighth centuries AD.

13 AFRICAN RED SLIP WARE IN SICILY DURING THE ROMAN EMPIRE AND LATE ANTIQUITY: THE REGION OF AGRIGENTO AND TERMINI IMERESE

Author(s): Ducati, Fabrizio (Università degli Studi di Palermo; Aix-Marseille Université) - Capelli, Claudio (DISTAV, Università degli Studi di Genova)

Presentation Format: Oral

From the beginning of II to the VII cent. A.D., African pottery is the most exported products in the western Mediterranean and beyond. Amphorae, tableware, cooking ware and lamps produced in an area corresponding roughly to Tunisia were spread in dif-

ferent regions of the Roman Empire. What remains of those products are well known by archaeologists, and they make a great chronological marker for this period.

These ceramics are characterized by a high degree of standardization. This can be explained by technical reasons (to easily place the ceramics in the kiln or in the holds of ships), but it can also show cultural implications, representing one of the unifying features of the Roman Empire. In this regard, the success of African pottery is demonstrated by the presence of imitations in different parts of the Mediterranean and beyond, like England or the Pontic region.

Sicily represents a privileged field to study African pottery: the proximity to Africa can explain the wide presence of these ceramics, that followed different distribution circuits as sub-regional differences show.

This paper will examine the presence of African Red Slips ware in two areas of Sicily, where the University of Palermo carry out surveys: the region of Termini Imerese (northern coast) and the region of Agrigento (southern coast). The analysis of vases shapes, linked to the study of fabrics, allows us to detect different areas of production and in some cases the atelier.

However, next to the best known and successful types we find some ceramics, especially flanged bowls that closely resemble African products, whose fabrics seem to differ from the main African productions. Are we dealing with products of secondary or unknown ateliers or they are local imitations? If the second hypothesis is correct, what is the reason to copy a very common product in Sicily?

14 **SOME REMARKS ON THE LATE ROMAN LAMP-MOULDS FROM THE POLISH EXCAVATIONS IN PTOLEMAIS (CYRENAICA)**

Author(s): Jaworska, Maria (Institute of Archaeology University of Warsaw)

Presentation Format: Oral

Ancient Cyrenaica (modern Libya) was the land located at the crossroads of the main maritime trade routes. It was also a place where Greek and Roman influences mixed. One of the most important cities of the Libyan Pentapolis was Ptolemais, which during the reign of Diocletian became the capital of the newly created province Libya Superior.

During the excavation conducted by a mission of the Institute of Archaeology of the University of Warsaw (2001-2010), a dozen fragments of late antique moulds for firing terracotta lamps were discovered. Research on the moulds and the lamps that matched them indicate their local production. The interpretation of the artefacts juxtaposed with the lamps found at other sites in Cyrenaica let us formulate the types and decorative schemes popular in local manufacturing. They constitute an important element in the discussion on both inter- and supra-regional relations that shaped the patterns used in local workshops. Moreover, further conclusions based on the analysis of ceramics, made it possible to define the trade model between Cyrenaica and other regions.

15 **“HISTORY POTS”: SOCIOCULTURAL AND COMMERCIAL EXCHANGE THROUGH THE CASE STUDY OF THE PUNIC-ROMAN CITY OF CARTEIA (SAN ROQUE, CADIZ, SPAIN)**

Author(s): Sánchez Moral, Carmen María (Universidad Autónoma de Madrid)

Presentation Format: Oral

Communication and trading hubs have always been optimal points to get an insight into cultural contacts and the transmission, exchange and assumption of different cultural features associated with and derived from it. Thus, the main aim of this paper is to address these phenomena of cultural interaction through the analysis of the ceramics found at the Punic and Roman port town of Colonia Libertinorum Carteia (San Roque, Cádiz, Spain). The interest of the exceptional case study of Carteia lays on its geostrategic location as the keystone of the arch of the Bay of Gibraltar. That is to say, a place between two continents, two seas and two bays.

While this interdisciplinary study will be multifocal and holistic, special attention will be paid to foodways, since gastronomy is an undeniable cross-sectional cultural marker. Being fundamental to human existence, food consumption implies a deeper dimension beyond mere subsistence, since it is the result of a cultural interpretation. Hence, we will focus on their primary pottery evidence -kitchenware and tableware-, crucial yet silent witnesses of daily culinary practices, although different pottery classes will also be taken into account. Moreover, this contribution will be organised diachronically in order to analyse the evolution and variation of social and commercial trends and their impact on local culinary tradition, as well as the relation -the “dialogue”- between imported ceramics and local productions during the transition from Late Punic to Roman Republican periods. These aspects prove to be highly enriching in terms of tracking the eventual arrival of new people, given the integration of Carteia in the Roman Empire as a colony - one of the first colonies with Latin rights outside the Italian Peninsula.

Vessels and cooking pots that become true “History pots” when put in the light of Archaeology.

16 **ROMAN LAMPS IN THE WESTERN MEDITERRANEAN AS EVIDENCE OF CULTURAL ADOPTIONS: BETWEEN ORIGINALITY AND (RE)PRODUCTIONS**

Author(s): Pereira, Carlos (UNIARQ - Lisbon University)

Presentation Format: Oral

The long and complex process of Roman conquest of Hispania, involves, aside from social, political and administrative issues, also a period of cultural integration. In fact, the main artefacts reflect the transmission of some Roman traditions that demon-

strates the relations between Romans and locals. In the West of Hispania, the use of lychnological artefacts were already used, but within the Roman framework they were subject to significative innovations, especially in terms of morphology and frequency. The contact with the products brought by Romans promoted the circulation of new types of vessels, but also inspired the local productions. If, on one hand, we can suggest that italic products promoted the "Romanity" of Hispanic populations, on the other, we must consider these artefacts as a symbiosis between two different cultures.

In this paper, we will present an overview of the Hispanic productions of Roman lamps, from the II century BC to the I century AD, exposing some chronological and typological questions that are relevant to the understanding of the Roman social-cultural adaptation. The more antique lamp (re)productions are linked to military movements and the conquest of Hispania, but some artefacts show different influences, materialised in lamps with Roman morphologies and local details. The existence of more and more potters in this geographical area culminated in a massive production of Roman lamps, some of them conceived by Hispanic artisans.

Some strategic settlements will be presented in order to establish a coherent and diachronic perspective of the consumption and production of Roman lamps. This analysis is relevant to the understanding of the evolution of the production of lychnological artefacts in the Western Mediterranean and its morphological features.

17 THE ROMAN-REPUBLICAN CASTELLA ON THE SOUTH-EASTERN COAST OF HISPANIA; OR, THE BEGINNING OF THE ROMANIZATION OF THE IBERIAN POPULATION

Author(s): Sala-Sellés, Feliciano (Universidad de Alicante)

Presentation Format: Oral

Some archaeological sites located on promontories of the north coast of Alicante were interpreted as small Iberian enclaves from the 2nd and 1st century BC dedicated to trade with Rome. This interpretation stemmed from their location next to good inlets and the outstanding number of Roman amphorae and, fine ware among the findings. The research being developed since 2010 reinterprets these sites as a network of forts built during the Sertorian wars, around 77 BC, to control the passage of senatorial ships between Ebusus and Carthago Nova. In this new context, Roman ceramics are no longer the object of exchange between Iberians and Italic merchants, but the kitchen and tableware used by legionaries, as well as the storage containers for their own food. The Iberian amphorae and other painted Iberian vessels present in the forts are the containers of the products that the Iberian population, allied with Sertorius, provided for the provisioning of the soldiers, but it may also be pointing out a hypothetical presence of Iberian auxilia in the coastal garrisons. In any case, it is through this contact, in the midst of a war in the 70's BC, when the Iberian population of the regio Contestania first encounters the Roman economic system and starts the slow but inexorable transmission of new cultural values.

18 A ROMAN SETTLEMENT IN THE CIVITAS PEREGRINA OF ELO (ELDA, ALICANTE) AND ITS IMPACT ON THE LATE IBERIAN POTTERY

Author(s): Poveda Navarro, Antonio Manuel (Universidad de Alicante)

Presentation Format: Oral

The Roman conquest of Carthago Nova (Cartagena) in 209 B.C. and the following creation of the Hispania Citerior province represented the beginning of a progressive process of economic and cultural 'romanization' in the south of Spain. In the 1st cent. B.C., this complex phenomenon was improved by the presence in this area of new Roman armies, during the hard civil wars among Sertorius, Pompeius Magnus and Caesar. One of the most important consequences of these historical events was the implantation of the famous Lucius Eros figlina. In this potter's workshop, Iberian artisans made both Roman lamps and typical painted Iberian pottery which imitated the shapes of the thin walled Italic pottery. This production represented an important example of the connections between the Iberian culture and the Roman one and it was commercialized in the most important cities of southern Spain, such as Carthago Nova (Cartagena), Ilici (Elche) or Lucentum (Alicante).

A. ELEMENTS OF CONTINUITY AND TRANSFORMATION IN THE CIRCULATION OF LOCAL AND IMPORTED CERAMICS IN THE CITY OF POLICASTRO BUSSENTINO (SA)

Author(s): Santoro, Elena (Etruria Nova Onlus)

Presentation Format: Poster

The archaeological data of Policastro Bussentino (Santa Marina, SA), also collected thanks to recent research conducted by the University of Genoa, provide evidence that the settlement had already taken a central role in the control of the most important trade networks along the coastal routes from the gulf of Naples to the Messina strait since the Archaic period. Furthermore, its port and the course of the nearby Bussento river guaranteed the activities of a hub for the exchanges that ended at the Diano valley, thus favouring a network of close relations with the sub-regional areas and the surrounding colonial settlements.

This framework is defined in a more precise way by the most ancient indigenous production in the sub-geometric Oenotrian style, dated to the period between the end of the sixth and the first half of the fifth century BC, and for which there are manifest similarities with the material evidence found at Parco Pinto, with styles reminiscent of what was documented at the nearby Palinuro, Sala Consilina and Tortora. They contribute to define and confirm the role that Policastro and his hinterland have had in this complex cultural framework.

Imported pottery (of Corinthian, Chiot, Ionic production) arrived to Policastro by sea and it was redistributed towards the towns of the hinterland (Roccagloriosa among them), while the latter and the colonies, instead, were producing imitation pottery such as the black varnish of Velia. The structure of this commercial network remained substantially unchanged even during the subsequent phase of Lucan occupation of the settlement/town, and persisted until the foundation of the Roman colony of Buxentum in 194 BC, when the new influences radically changed the social, cultural and economic structure of the Gulf of Policastro.

B. 'MINOR' CERAMIC-ARTIFACTS IN THE NORTHERN TYRRHENIAN AREAS (LIGURIA, CORSICA). DATA FROM THE SECOND IRON AGE UP TO THE ROMAN PERIOD

Author(s): Piccardi, Eliana (MIUR-Italian Ministry of Instruction, University, Research. Teacher of Humanities at the Secondary State School; Independent researcher)

Presentation Format: Poster

Beyond the major vessels productions, an investigative light will be shed on the scattered universe of all those ceramic artifacts (e.g. bricks, tiles, domestic objects related to textile practices and so on) sometimes appeared as 'minor' evidence within the material culture of the ancient sites.

The first emerging datum is the atomization of their producing centers, just occasionally enlightened by archaeometric analyses. Beyond some better known building materials of the Roman period (especially the rare stamped ones of the Empire centuries), their production and circulation in the considered Northern Tyrrhenian areas has been very seldom matter of summarizing investigation.

These objects have already been considered as sign of the Roman know-how arrival in the 'underdeveloped' native societies, although well dated assemblages are still rare. Besides, formerly considered 'local' productions may sometimes reveal, instead, a certain circulation of these material, too, at least in a sub-regional scale.

Similar interpretative issues may also affect domestic tools like e.g. whorls and spinning loads, or also other kinds of artifacts like the so called 'phocula', ceramic 'rings' of some Liguria sites.

These ceramic artifacts considered between the Second Iron Age and the Roman Period, although rather heterogeneous in their whole, on one side may appear crucial to define the cultural status of the communities and their achieved acculturation degree, beyond their identity. On the other hand, domestic lesser ceramic objects, within the native ancient communities of Liguria and Corsica also along their Romanization process, may be assumed as a clue of the persistence in their material culture.

This preliminary collection of evidence aims therefore to furnish a 'state of the art' about these ceramic materials in their various contexts, as a base of knowledge for coming sceneries of data and interpretations, hopefully with a wider support of archaeometric analyses within an overall view.

164 THE ARCHAEOLOGY OF MEDICINE AND HEALING IN PREHISTORIC AND PROTOHISTORIC EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Alusik, Tomas (Charles University, First Faculty of Medicine) - Aamodt, Christina (Independent Researcher)

Format: Regular session

The medicinal and healing practices of prehistoric and protohistoric Europe have not been as thoroughly and systematically researched as the practice of medicine during Classical and Late Antiquity. The reconstruction of healing practices during this period depends almost exclusively on archaeological evidence, and concerns skeletal remains with indications of treatment, the existence of medical instruments, evidence for remedial residues and the use of therapeutic properties of plants, representations of body parts afflicted by an illness or pathology, and depictions of healers and healing practices. The identification of structures and places associated with the practice of curing, and evidence for the worship of deities believed to prevent and protect from, or heal illness, further enriches the reconstruction and understanding of medical practices in the past. Indeed, an interdisciplinary approach to the practice of medicine in the prehistoric period combining specializations such as bioarchaeology, palaeopathology, palaeodiet, archaeobotany, and organic residue analysis appears to be crucial for fully understanding the different aspects of medical practices. The aim of the session is to bring together researchers that examine medicine and healing from different angles in order to reconstruct prehistoric/protohistoric medicine. We welcome a wide spectrum of papers with a particular emphasis on methodology and the use of scientific techniques in the identification and analysis of medical practices, as well as case studies. Papers can address but are not limited to the following topics:

- Methodologies and techniques applied to the research of prehistoric medicine
- The evidence for the practice of medicine in prehistoric/protohistoric Europe
- The challenges in the recognition of prehistoric/protohistoric medicine in the archaeological record
- The preventive aspects of medicine and their identification in the archaeological record
- The social and spiritual aspects of healing
- Healers and practitioners

ABSTRACTS

1 THE SURGICAL INTERVENTION DURING THE STONE AGE: RITE AND MEDICINE

Author(s): Mednikova, Maria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The practice of surgical body manipulations has deep roots in the Palaeolithic and Mesolithic ages. The earliest cases seem to be the Upper Palaeolithic symbolic trepanation from Telmanovskaya site and the surgical one of the Mesolithic male Vasilyevka 3. Surgical operations could be used for rites of passage, as could be argued for the case of a young woman from the Mesolithic Mursak-Koba site. When she was teenager, both her little fingers were amputated, then when she married she was subjected to a symbolic trepanation. The osteological collection from the Museum of Man in Paris still has no analogies regarding the representation of ancient trepanations in the Old World. My study concerns a re-examination of skulls with traces of intravital trepanations. I have looked at two categories of objects from the collection of Neolithic trepanned skulls: trepanned skulls and bone plates (rondelles). The evidence is indicative of the complexity of the spiritual life in the Stone Age and allows to trace the development of surgical intervention techniques among people in different chronological periods: from late Neolithic farmers to Gauls (Celts), and early medieval Merovingians.

2 ANATOMICAL MODELS AND THE RECOGNITION AND REPRESENTATION OF DISEASE IN MINOAN BRONZE AGE CRETE

Author(s): Peatfield, Alan (University College Dublin)

Presentation Format: Oral

Anatomical models as votive offerings are a worldwide phenomenon. In Greek civilisation they occur multiple times. They are famously found as clay offerings in the Classical Greek and Roman temples of Asklepios, and of course, as gold and silver *tamata* beside icons in modern Greek chapels. Their earliest manifestation however, is within Minoan Bronze Age civilisation on the mountain shrines known as peak sanctuaries. Here they form part of the characteristic votive assemblage of clay figurines which defines the ritual practices of the peak sanctuaries. We (with Christine Morris and Brendan O'Neil) are publishing this material as part of the collaborative East Cretan Peak Sanctuaries project, which seeks to publish old material originally excavated by Prof. Costis Davaras. We have identified far more votive limbs than originally expected. This demonstrates that these are not merely random representations, but reveal a consistent of the recognition of disease within Minoan culture. Furthermore, while most of these show the part of the body affected, some show recognisable symptoms of disease. Through this paper we propose to place these finds within the broader phenomenology of anatomical votives, especially considering that they are amongst the earliest examples.

3 PURIFICATION RITUALS AND THE NOTION OF HYGIENE IN MYCENAEAN GREECE

Author(s): Aamodt, Christina (Independent researcher)

Presentation Format: Oral

The concept of pollution and ritual purity in Mycenaean Greece can be supported by archaeological and written evidence. The presence of specific installations for the performance of ablutions in cult buildings, the evidence for fumigation rites and the burning of incense in chamber tombs and shrines attest to notions of ritual cleansing before the performance of religious rites and the idea of pollution, particularly in relation to the dead body. Traces of fire inside chamber tombs have been interpreted as fumigation rites performed in order to purify the atmosphere prior to re-entering the tomb. Such a practice could reflect the notion of impurity associated with the dead body, but at the same time might have served also a more practical function, that is, to protect those coming into contact with the dead from health risks. The aim of this paper is to examine whether some purification rites performed by the Mycenaeans could have some reference to aspects of hygiene, in addition to the religious belief in pollution and ritual cleansing, attesting to a basic understanding of contagion and health risk.

4 METHODOLOGY AND SOURCES FOR THE "HISTORY" OF PREHISTORIC OR "DARK AGE" MEDICINE: THE CASE OF GREECE

Author(s): Alusik, Tomas (Charles University, First Faculty of Medicine)

Presentation Format: Oral

While studying the "history" of prehistoric or "Dark Age" medicine, it is necessary to almost exclusively come out from archaeological and anthropological sources. Their statement can be supplemented with iconographic sources and sometimes even with literary ones. However, this brings specific methodological problems mostly connected with their testimony/evidentiary value that will be discussed in this paper. With respect to a different evidentiary value of the sources and a range of methodological problems connected with them, possibilities of overall summary of their testimony into a meaningful unit and creation of a universal model and concept for study of the "history" of medicine valid for the prehistoric period or "Dark Ages" are going to be discussed. On a secondary level, the author is going to try to define the "history" of medical science of the prehistory or "Dark Ages" as an academic subject, and he will try to prove that it is an interdisciplinary subject applying and combining not only the methods of historical, but also of natural and medical sciences. As an example and a case study, the author is going to use the (history of

medicine of the) prehistoric (Neolithic and the Bronze Age – approximately 6800/6000-1100/1050 BC), “Dark Age” (in archaeological terminology sc. Submycenaean/Subminoan, Protogeometric and Geometric periods, approximately 1100/1050-800 BC) and Archaic periods (approximately 800-500 BC) of Greece. There are several groups of sources available for the “history” of medicine of these periods in Greece (belonging to the four basic categories), including e.g. the human skeletal material, Linear B tablets, Homeric epic, terracotta anatomical ex-vota and scenes of fresco and vase painting.

5 HEALING THROUGH WATER IN LATE IRON AGE THRACE – MYTH OR REALITY?

Author(s): Avramova, Mariya (The Antiquity of Southeastern Europe Research Center, University of Warsaw)

Presentation Format: Oral

Thrace for its most part is situated on the territory of present-day Bulgaria, a country famous for its many sources of mineral water highly valued for its medicinal properties. Romans made use of the waters by establishing healing settlements near most springs. Only some of those spas have been a subject of large scale excavations mainly focusing on the Roman remains and paying less head to the Late Iron age material. Despite this, the publications summarizing the results of the research often state a continuous use of the springs for medicinal purposes since at least the Late Iron age. But what is the basis for such an interpretation?

Often it is the discovery of small finds that can be attributed to the Late Iron age, in other cases it is the unearthing of votive tablets and cult objects pointing to the use of the site for religious purposes. However, can this be interpreted as evidence for the use of the mineral water for healing purposes as argued by some archaeologists? And how does such an interpretation fit into what little we know about Thracian medicine? The paper addresses those matters by taking a closer look at the archaeological remains, attributed to the Thracians and discovered in different Roman spas, believed to have been in use in the Late Iron age.

6 DISHING THE DIRT ON THE TEXTILE TOOLS FOUND IN THE BATHS OF ROMAN PROVINCES

Author(s): Pásztoókai-Szeoke, Judit (Independent Archaeologist)

Presentation Format: Oral

In her publications of the small finds from Roman bathhouses, both public and military, A.M. Whitmore (2013 and 2016) called our attention to the occurrence of textile tools among them, such as whorls, weights, needles and weaving tablets. She also outlined several possibilities for the interpretation of their presence. First, they were not used as cloth working tools at all, but among others as medical or hairdressing instruments or door-weights. According to her other interpretation they were used for producing textiles or rather mending garments as a pass-time activity either by the bathers themselves or by slaves and attendants. Moreover, she suggested the possibility that this kind of activity could have been part of a commercial service in the baths. The present paper will offer a different interpretation of these textile tools, based on the recent research on the finds found in connection to the workshops which were probably providing textile and cloth refurbishing services (e.g. mending, cleaning, re-dyeing) to the inhabitants of the Roman colonies of Savaria and Siscia, and will also emphasize the interdependence and vital importance of corporeal and sartorial hygiene in densely populated regions, such as urban areas or military camps and the tragic consequences of the absence of hygienic practices in the past.

A. TOWARDS THE CREATION OF A PALEOPHARMACOLOGICAL REFERENCE COLLECTION: THE CASE OF PHYTOLITH ANALYSIS

Author(s): Cano i Cano, Nit (Universitat Rovira i Virgili, Departament d'Història i Història de l'Art; Catalan Institute of Human Paleocology and Social Evolution - IPHES)

Presentation Format: Poster

Plants are and have always been one of the main resources of human activity and, as such, their identification and study is increasingly frequent in archaeological research, as well as relevant to palaeoenvironmental reconstructions. However, despite numerous species and components being identified currently in the archaeological record and recognized for their pharmacological properties, few published studies discuss the possible knowledge and use of these medicinal plants by prehistoric communities.

To identify these evidences the construction of reference collections and the search for references will be of vital importance for most of the archaeological disciplines, especially for those that are still in their defining phases, such as the case of the paleopharmacological subdiscipline and the analysis of phytoliths.

The study of phytoliths in archaeological samples has always been based on the definition of morphotypes identified thanks to the comparison with references of modern plants, there being many studies focused on the characterization of grasses or other plants of recognized dietary or technological use. The present work aims to contribute to the study of the archeology of medicine in prehistoric times, initiating the creation of a paleopharmacological reference collection of phytoliths from plants with recognized pharmacological use documented in the archaeological record of the Middle and Upper Palaeolithic in Catalonia (Spain). The objective of these studies is to assess the viability of phytolith analysis as a proxy to identify medication behaviors among prehistoric communities through the sampling of sediments, artifacts or dental calculus.

With our preliminary results, this poster aims to highlight the importance of creating new multiproxy references for the interpretation of the paleopharmacological record, especially for those periods in which we cannot rely on documentary sources or find structures, objects or other indicators that can evince the existence of medicinal practices.

Theme: Archaeological theory and methods beyond paradigms

Organisers: Steinforth, Dirk (Independent Researcher) - Thoeming, Alix (The University of Sydney)

Format: Regular session

In academic discourse and popular perception, current research still inherits and perpetuates many long-held questionable truths about Vikings and the Viking period. In this spirit, we seek to present new interpretations of the 8th-11th centuries AD in Scandinavia, the Baltic, the British Isles, and the North Atlantic that combat many persistent characterisations and interpretations of the evidence of that period known today that – due to lack of review – have vitrified into the likeness of ‘fact’. Focusing on the Viking period, the session aims to brush the dust off some old paradigms and critically examine examples of archaeological, historical, and epigraphical ‘facts’ that on closer examination do not deserve this name. We hope to probe views, tackle puzzles and controversies, re-visit doctrines, debunk old readings, clear up ambiguities, and provide new ideas for those pesky ‘factoids’ that have far too long obscured our understanding of the Viking world. In particular, this session invites contributions from post-graduate and early career researchers seeking to put old doctrines of the Viking Age to the test, introducing new conceptual, theoretical, and methodological methods and approaches. Together, we aim to challenge vitrified views of the Vikings.

ABSTRACTS

1 NOBLE CLASS IN THE ‘ANCIENT DANISH KINGDOM’: THE STORY AND HISTORIOGRAPHICAL CONSEQUENCES OF ONE MISREADING

Author(s): Sukhino-Khomenko, Denis (University of Gothenburg)

Presentation Format: Oral

Throughout present-day Denmark and Sweden are scattered 46 runic inscriptions commemorating certain ‘thegns’ and 73 in memory of ‘drengs’, but up until 1927 these runestones attracted little attention on the part of the researchers. In that year, Danish historian and archivist Sven Aakjær (1894–1963) published his most famous and influential article to re-evaluate the traditional reading (‘[mature/young] man’ respectively). Instead, he concluded that these lexemes closely correlated to the usage in England and used to be technical terms for strata in the royal retinue (ON *hirð*) in the ‘ancient Danish kingdom’.

Ever since then the Scandinavian historiography has been divided on this problem. Some pointed out the lack of native solid evidence in Aakjær’s thesis, while other wholeheartedly embraced it. The latter had far-reaching historiographical consequences, as Aakjær’s interpretation has on multiple occasions been used in the account of early medieval Danish politogenesis (Klavs Randsborg, Peter Sawyer, Carl Löfving, et al.): thegns and drengs, understood as royal agents in the land, testified to the authority and deep reach of the newly-formed Danish monarchy. This postulate has penetrated the Scandinavian historical discourse so deeply that it is even reflected in popular media, e.g. at the exhibition at ‘Kata Gård’ (Västergötland).

However, closer scrutiny of Aakjær’s original article reveals that his whole argumentation was built on ‘quicksand’: a misreading of the mid-12th-century English quasi-legal treatise ‘Constitutiones de Foresta’ that Aakjær believed to be a genuine production of King Cnut’s reign (1016/18–35), though this interpretation had been firmly refuted already in 1894.

The proposed article is going to address three key points:

- How did this misreading nearly reached the status of a ‘fact’?
- What historiographical consequences followed it?
- Why is it vital to meticulously venture ‘ad fontes’ when conducting historical research?

2 VIKINGS, BARBARIANS, AND THE BALTIC SEA. THE VIKING AGE AS AN ARTEFACT OF HISTORY?

Author(s): Thoeming, Alix (The University of Sydney; UrbNet, Aarhus University)

Presentation Format: Oral

Viking Studies and Viking Age archaeology have long had a clear mission, to clarify and repair the image of the Vikings which predominated for many years; barbarous savages, cast in the role of anti-Christ, storming through the sophisticated European continent. These efforts have resulted in a remaking of their public image, and the complexity, sophistication, and interconnectedness of the Viking World is now extraordinarily well known. This singular focus on the Vikings, however, has led to the popular perception of them as the predominant force from the North during the Early Medieval Period, overwhelming the developments which were also taking place across the rest of the Baltic. The same perceptual misfortune that once befell the Viking has almost now also befallen the Eastern and Southern Baltic. This presentation, based on the investigation undertaken as part of a completed PhD project, will present the phenomena of the urbanisation of the Baltic Region during the Viking Age. It will show that, in fact, some archaeological traditions long thought of as emanating from the Viking homelands should in fact be viewed as an ‘extra-Viking’ phenomenon. Should the ‘Viking Age’ thus be discarded?

3 VIKING WARRIORS IN POLAND? OVERCOMING AN IDENTITY CRISIS

Author(s): Gardela, Leszek (Department of Scandinavian Languages and Literatures, Bonn University; Department of Archaeology, History, Cultural Studies and Religion, Bergen University)

Presentation Format: Oral

Since the discovery of a richly furnished Viking Age weapon grave in the cemetery at Ciepłe in Pomerania in the year 1900, there has been an uncritical tendency among many Polish archaeologists to consider male graves with opulent goods and military equipment as belonging to Scandinavian warriors. To this day, numerous scholars are convinced that the people buried with lavishly decorated spurs and horse tack in the cemetery at Lutomięsk in Central Poland also came from Northern Europe or at least that they had strong connections with Scandinavia or Rus. The same conviction pertains to rich weapon graves from places like Luboń and Łubowo in Greater Poland. This paper will challenge these interpretations, demonstrating how the weak foundations they are built upon have led to serious misconceptions about social identities and cross-cultural interactions in the Viking Age. By re-analysing the most iconic graves from these sites, it will be demonstrated that their contents can provide fascinating insights not into Scandinavian but actually into West Slavic warrior identity. This interpretative shift can have serious implications not just for Polish archaeology but also for the understanding of the much wider Viking world.

4 THE NATURAL CHOICE - RECONSIDERING THE TRADITIONAL APPROACH TO NATURAL PRODUCTS IN THE VIKING AGE BURIAL SPACE

Author(s): Jelčić, Anna (Stockholms University)

Presentation Format: Oral

In the interpretation of the traces of funerary practices, the primary concern was traditionally not placed upon the sustained engagement with the entire materiality visible to us, but rather upon the selection of the material categories that are suitable for establishing the stylistic chronologies, construction of narratives, and exhibiting in museums. A good example of this selective removal from the narrative about Viking Age burials are the so called natural products (Swe. *naturalier*) often found deposited among the cremains in Viking Age burial urns: pebbles, hazelnuts, fossils, cultivated and wild seeds and other plant remains, avian eggshells, minerals, etc. The focus on grave goods of high quality and on stylistically specific artefacts can be inverted to ask how is it that various forms of matter from the same context have different appeals and become treated differently during excavation, analysis, interpretation, storage, and exhibitions. Is this issue of hierarchizing material based upon the scientific potential of things and the production of knowledge about Viking Age funerary practices or is it established and normalized during the history of the archaeological discipline and in the way the modern science classifies reality?

The aim of this article is to bring into sharper relief the importance of natural products in Viking Age cremation rituals. Rather than emanating from the traditional rhetoric within the field of Viking Age studies, where these objects were seen as mundane and of low priority, this paper takes its cues from the wider debate on materiality within the social sciences and in philosophical phenomenology, respectively, and thus pushes funerary archaeology into fuller engagement with material remains of post-cremation practices.

5 WERE THEY ALL SLAVES? COMPARATIVE PERSPECTIVES ON SOCIAL INEQUALITY, ENSLAVEMENT, AND RITUAL VIOLENCE IN VIKING-AGE SCANDINAVIA

Author(s): Raffield, Ben (Uppsala University)

Presentation Format: Oral

In recent years, advances in scientific analyses have allowed scholars to re-examine a corpus of human remains, recovered from a number of double- and triple-burials from across Scandinavia, in which the 'primary' occupant of the grave is accompanied by one or more individuals who had suffered a violent death. These individuals are often interpreted as slaves who were sacrificed in order to accompany their owners to the afterlife, a hypothesis that finds agreement in mythological and historical sources that describe the killing of slaves as part of funerary rites. The most influential of these is undoubtedly the account of Ahmad ibn Faḍlān, who in 922 witnessed the brutal killing of a slave-girl during the funeral of a Rūs chieftain on the banks of the Volga River.

While these sources are explicit in describing the sacrificial killings of slaves as part of the funerary process, the archaeological evidence is less conclusive. Interpretations are often made based primarily on the atypical treatment of the dead themselves, a problematic assertion that is usually supported by references to the written sources. The identification of remains that appear to broadly conform with surviving narratives in turn serves to legitimise the sources themselves, meaning that scholars run the risk of creating an interpretative 'feedback loop,' which limits the potential to study and understand these burials within their individual archaeological contexts.

This paper outlines a study designed to explore the purported links between ritual violence and enslavement during the Viking Age, which will combine the examination of 'slave burials' with a comparative analysis of social inequality, slavery, and ritual killings. The study will be implemented with a view to shedding light on the lives of the individuals who were the focus of these acts, as well as the purposes that their deaths were intended to serve.

6 CHALLENGING THE PARADIGM OF VIKING-AGE ANIMAL-STYLE ART

Author(s): Wicker, Nancy (University of Mississippi)

Presentation Format: Oral

Viking-Age art has long been equated with animal-style art, to the exclusion of human, figurative art. However, a closer examination of the corpus of art of the Viking world reveals that human figures were never absent, although they were sometimes subsumed into compositions dominated by abstracted, zoomorphic depictions.

In the history of Scandinavian archaeology and art history from the nineteenth century onwards, such a great emphasis was placed on the typological classification and chronological study of the development of the animal styles of Viking and pre-Viking art that anything that did not fit that paradigm was often overlooked or disregarded as “foreign influence.”

However, the corpus of Viking-Age art is being transformed with a flood of new finds as a result of metal-detecting, especially in Denmark and England. Although metal-detectorists have discovered objects with zoomorphic ornamentation, many of the recent finds display figurative subjects, and some of the new examples are three-dimensional depictions that reveal details of Viking-Age dress, coiffures, and accessories including jewelry and weapons. As more examples of this art come to light, we glimpse a view of Viking art and Viking-Age people that had previously been nearly unknown through visual sources. In particular, newly found artistic works depicting women carrying weapons should be seen in light of the so-called “female Viking warrior,” as confirmed by DNA analysis, who was buried at Birka in Sweden.

In 1966, David Wilson declared that “animal art was the only art which really satisfied the Viking mind;” nevertheless, due to the recent finds, no one can assert that figurative art was merely a negligible afterthought among the Vikings.

7 SUTTON HOO FROM AN OUTSIDE PERSPECTIVE

Author(s): Pearl, Frederic (Texas A&M University at Galveston)

Presentation Format: Oral

Most archaeologists, even in America, have some familiarity with the famous 7th century Anglo-Saxon burial site, Sutton Hoo. Its royal character, unique burial tradition, and characteristic material remains have come to body symbolize Anglo-Saxon culture, and even contributes to the national identity of the English. It came as a surprise, then, after beginning research on Vendel Period burials on Gotland that the Sutton Hoo burial pattern should be found repeated there in Sweden, not once, but perhaps up to 2 dozen times. The vast majority of English-language literature available on the subject suggests the the relationship between Sutton Hoo and the Vendel sites are either coincidental or of minor significance. If not for the tacit agreement by the distinguished Swedish archaeologist, Sune Lindqvist, national bias among English scholars might be considered a likely explanation for the accepted interpretations. However, as a neutral observer I find the argument that Sutton Hoo does not considerably indicate a strong if not colonial presence of Swedish Vendel society to stretch credibility. As the dead do not bury themselves, there must have been a community of people well-aware of the proper way to memorialize a Vendel leader. The existence of at least 2 other similar burials in Suffolk must be considered to confirm a substantial Swedish influence on southeastern Britain. An evaluation of the history of interpretations at Sutton Hoo helpfully reveals sources of bias and conflicts of interest among previous stakeholders.

8 WHENCE AND WHITHER, ÓLÁFR? ON THE LOCATION OF THE VIKING REALM OF ‘LAITHLIND’

Author(s): Steinforth, Dirk (Independent Researcher)

Presentation Format: Oral

In 853, Óláfr, son of the king of ‘Laithlind’, came to Dublin and became one of the most powerful Viking kings in the Irish Sea, before, according to one account, returning to his native land of ‘Laithlind’, about 872. For a short but important period, this kingdom had a profound influence on events in Ireland and north Britain. Vexingly, however, extremely little is known about it, making it impossible to properly assess its role in 9th-century Irish Sea history: We do not even know its geographical location.

This issue turned into the subject of lively scholarly debate, with scholars discussing whether this mysterious realm was to be taken as a kingdom in the Vikings’ homeland, in west Norway, or rather as a Viking colony in south-west Scotland. But due to very limited evidence, neither theory could be proven or even considered superior to the other. Thus, stuck between two possibilities, the question remained unanswered.

In 2018, two new – and mutually exclusive – hypotheses emerged, providing fresh ideas for tackling the old problem. One of them is argued in this paper, and by following the footsteps of king Ólaf and viewing ‘Laithlind’ in the context of the king’s objectives and politics during a period of Viking expansion in the Irish Sea area and beyond, it favours a location in west Scotland.

9 BEYOND BRUTALIZATION AND PACIFICATION: REASSESSING VIKING AGE SOCIETY IN NORTHERN SCOTLAND

Author(s): Cartwright, Rachel (University of Minnesota)

Presentation Format: Oral

The popular media often portrays the Scandinavians of the Viking Age as bloodthirsty and amoral people, propelled through life by their baser instincts. This is a viewpoint that contemporary written sources promoted with the heathen hordes wreaking havoc on the unsuspecting Christians of Europe. However, some archaeological evidence has been used to present an alternative

viewpoint, with the peaceful Scandinavian farmer being pushed to the forefront of interpretation. This pacification of the past can be seen in other time periods as well, with it having been a general theme in archaeology with many scholars discussing this for a variety of time periods. This paper seeks to reconcile these two extreme viewpoints. In order to try for a more balanced interpretation this paper explores the archaeological evidence from Orkney, a place known to have been inhabited by the Picts and the Vikings simultaneously. By exploring the settlement and burial evidence from several sites a more balanced approach to the archaeology is sought, trying neither to brutalize nor pacify the past.

10 VIKING AGE DIET IN AARHUS: AN ISOTOPIC INVESTIGATION OF HUMAN AND FAUNAL REMAINS

Author(s): Swenson, Dain (Department of Icelandic and Comparative Cultural Studies, University of Iceland) - Fuller, Benjamin (Department of Archaeology and Heritage Studies, Aarhus University) - Kveiborg, Jacob - Ritchie, Kenneth (Department of Archaeological Science and Conservation, Moesgaard Museum) - Kristjánsdóttir, Steinunn (Faculty of History and Philosophy, University of Iceland) - Olsen, Jesper (Aarhus AMS Centre, Department of Physics and Astronomy, Aarhus University) - Linaa, Jette - Larsen, Lars (Department of Archaeology, Moesgaard Museum) - Mannino, Marcello (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

Stable isotope ratio analyses on Viking Age human and faunal specimens from Denmark have only been undertaken at a few sites (e.g. Galgedil). Little evidence of the diet of inhabitants of Viking towns is available and isotopic baselines for detailed reconstructions are also lacking, with the notable exception of the baseline for Hedeby (= Haithabu). Our study, funded by the Aarhus University Research Foundation (Aarhus Universitets Forskningsfond) through the project titled Danish and European Diets in Time (AUFF grant number: 21276), addresses both these issues, presenting carbon and nitrogen isotope data on human bone fragments and on a wide range of likely contemporaneous fauna which were recovered during excavations at Sankt Clemens Stræde in Aarhus (central-eastern Jutland). Aarhus (= Aros) was founded by the Vikings in the 8th century and became one of the largest towns in Jutland, alongside Ribe and Hedeby. A ring fortress was constructed in the 10th century to protect the town and was later reinforced by Harald Bluetooth, which suggests this was a politically and militarily strategic settlement, as well as a major trade centre. The faunal remains will be used to establish the local isotopic baseline for Aros and include: domesticated animals (e.g. cattle, pig, sheep, horse, cat), birds (e.g. waterfowl, crow) and 12 species of fish (e.g. cod, haddock, herring, perch). The results of this research will be used to investigate the diet of the Viking inhabitants, as well as provide important data on the local trophic web and on whether the fish consumed in Aros were caught locally. Moreover, the isotopic data from the fauna will be useful to investigate the relationship between the town and its hinterland, which is important to ascertain the degree of urbanization.

A. TANGIBLE ENCOUNTERS – ‘FOREIGN’ OBJECTS IN VIKING AGE SCANDINAVIA

Author(s): Kuhn, Laura (Albert-Ludwigs-Universität Freiburg)

Presentation Format: Poster

A vital aspect of today's understanding of the Viking Age are the intensive contacts between people from Scandinavia and their neighbours around the North and Baltic Sea, the European continent as well as regions as far as the Byzantine Court or the Islamic Caliphate. The archaeological record shows clear traces of these contacts: objects of different and distant provenances have found their way to Scandinavia – ranging from harness mounts from the British Isles, glass vessels produced in the Rhineland to coins minted in Baghdad.

The aim of the project is to evaluate how these objects were incorporated by contemporary Scandinavian societies. What are these objects and what about them can be considered ‘foreign’? In what contexts do we find them? How were they used (e.g. re-worked)? Did they have influences on Scandinavian material culture? Using a biographical, contextual and relational approach, a methodology is developed that challenges traditional propositions of dichotomous and static differentiations between ‘foreign’ and ‘own’, as well as simplistic interpretations of ‘foreign’ objects as prestige goods. Based on a detailed study of the objects and their contexts, their handling in practice, a dynamic and relative understanding of foreignness allows a much more differentiated and accurate insight into how Scandinavian societies of the Viking Age dealt with the tangible impacts of their cultural encounters.

B. SCANDINAVIAN FIBULA FROM THE FINNO-UGRIC BURIAL: MOBILITY OF PEOPLE OR THINGS AND IDEAS?

Author(s): Zelentsova, Olga - Saprykina, Irina (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Poster

Things related to the Scandinavian world are traditionally regarded as a vivid proof of the presence of natives from Scandinavia for the monuments of the European part of Russia. The presence of Scandinavians in this territory is not called into question. But interesting are signs of Scandinavian presence in areas located quite far from the recognized eastern Viking outposts - Ladoga, Gnezdovo, Shestovits. We detected the influence of the Viking world on the territories, separated by a distance of hundreds of kilometers from these centers.

One of such centers is a Finno-Ugric burial – Podbolotje located at the Oka river (Vladimir region), which is a small series of findings of Scandinavian antiquities: amulets, pendants and brooches from the women's and men's costumes. The context of these

findings reflects that it is not always the mobility of people, but often the mobility of ideas and traditions.

The most interesting is the discovery of a round fibula type IIB (by I. Jansson), found in a female burial. These fibulas are quite traditional for Scandinavian women's costume and are attached to garments. For example, such brooches are common for Birka burials.

In the Podbolotje fibula was found in traditional Finno-Ugric burial. The costume and details do not differ from the indigenous Murom funeral rite. Thus, this burial does not stand out among all other female burials. The pin and the clasp of fibula have traces of several repairs and usage as a necklace. But in the grave it was located exactly where it should be – on the chest. Apparently, the Scandinavian brooch was included in the funeral costume because it had a certain meaning, perhaps associated with the status of the buried or with a consequence of the wider spread of the Viking world beyond the traditionally considered territories.

169 **CRIMES IN THE PAST: ARCHAEOLOGICAL AND ANTHROPOLOGICAL EVIDENCE**

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Shvedchikova, Tatiana (Institute of Archaeology Russian Academy of Sciences) - Moghaddam, Negahnaz (Center of Legal Medicine, University Hospitals Lausanne - Geneva) - Barone, Pier Matteo (American University of Rome)

Format: Regular session

Cases of historic and prehistoric "crime scenes" are known from various context including findings of (pre)historic (mass) graves and lethal violent acts related to warfare, ritual killings, or possible murder cases. In order to get to the bottom of the possible archaeological crime scenes, contemporary interdisciplinary approaches allow us to extend the frames of the classical archaeological study. New archaeological and anthropological biochemical analyses, for example elemental and isotopic analysis of the human bone, together with innovations in imaging techniques, such as 3D surface acquisition, computed tomography and X-ray of the skeletal remains for trauma investigations, and survey techniques, such as GPR modelling of the burial site, increase the initial information value. New technologies allow anthropologists and archaeologists to get more information on past killings and possible murder practices and offer a better understanding of archaeological "crime scenes". For example, modern scientific methods also aided the development of new archaeological disciplines such as 'forensic archaeology', which uses, among other things, the application of archaeological theory and methodology to search and excavate burials of human remains or objects in legal investigations. While modern crime scenes are more or less evident, the crimes of the past are hardly detected. Problematic is that archaeological violent deaths and possible attempts to hide the murder evidence often disappear in conclusions related to past human ritualistic behavior. The aims of the session are to discuss the possible examples of crimes in the archaeological past, their detection and interpretation with the help of modern scientific methods, and to discuss how interdisciplinary approaches could be conducted in further research concerning "crimes of the past".

ABSTRACTS

1 **'ARROW IN YOUR SPINE': TO THE QUESTION OF RECOGNITION THE INTENTIONAL KILLING IN ANCIENT HUMAN BURIALS**

Author(s): Shvedchikova, Tatiana (Institute of Archaeology Russian Academy of Sciences) - Moghaddam, Negahnaz (Center of Legal Medicine, University Hospitals Lausanne - Geneva)

Presentation Format: Oral

Human remains are excellent source for reconstruction the past life of ancient societies.

Questions addressed by anthropologists and archaeologists include the circumstances of the individuals' death: Why and how the individual died? Are there any traces of a possible violent act?

Interpersonal violence is a good indicator for further social reconstructions but signs of killing are not always visible and lesions on the bones can often not be classified as traces of a violent act. Taphonomic changes and methodological difficulties during the excavation as well as during the analyses might lead to misconclusions. Assassination weapons still stacked in bones for example can be very good indicators for a killing scenario but are nonetheless rare cases. A series of examples of ancient killings will be presented as well as unsolved cases. Some case studies are known from medieval Russia, including also slashed traumas. Furthermore, examples of possible poisoning will be discussed.

It should be ruled out that especially interdisciplinary research on human remains as an independent source can provide important information on what might have happened in these ancient cases and whether we are dealing with a possible „crime scene“.

2 **EVIDENCES OF INJURIES AND MURDERS IN THE POSTCATACOMB WORLD (XXII-XVIII CAL. BC)**

Author(s): Mimokhod, Roman (Institute of Archaeology Russian Academy of Sciences) - Olga, Zagorodnia (Independent researcher)

Presentation Format: Oral

The block of postcatomb cultures was formed at the finale of the Middle Bronze Age on the territory of the Steppe – Forest-Steppe from the Dniester to the Urals. It included the Babino Cultural Circle and the Lola Cultural Circle and existed in the XXII-XVIII centuries BC. This is a period of great migrations and, accordingly, military conflicts. Evidences of conflicts are traced at the burials of

this chronological period. Mostly, these are arrowheads, which location in the graves clearly indicates that the buried men were wounded or killed. They were found in a neck, chest, spine, pelvis and legs. There are 16 burials of the Dnieper-Don Babino culture, 2 burials of the Volga-Don Babino, 2 burials of the Dnieper-Prut Babino, 3 burials of the Lola culture. It is interesting that overwhelmingly these arrowheads turned out to be other cultures' as opposed to burials where they were found. So according to the arrows types we can trace the military conflicts between the representatives of the Volga-Don and Dnieper-Don Babino cultures in the Volga-Don region where their areas were in contact. In Caucasus region, where the sites of Lola culture were located, the arrowheads at the spine of one skeleton belonged to the Ginchy culture. Its area was the North-Eastern Caucasus. In turn, Lola societies clashed with more northern Babino cultures. It was evidenced by Lola types of arrows in the backbone of neighbors. Large military conflicts occurred during second part of the period under review. They were associated with the chariot cultures expansion, that forced out the carriers of postcatacomb traditions in the southern and western directions. And there are a number of burials, first of all, of the Dnieper-Don Babino culture, where arrowheads of eastern neighbors are found in the skeletons.

3 CRITICAL MASS - COMPARATIVE ANALYSIS OF MULTIPLE BURIALS FROM PREHISTORIC ARCHAEOLOGICAL CONTEXTS FROM HUNGARY

Author(s): László, Orsolya (Hungarian National Museum) - Köhler, Kitti (Institute of Archaeology, Hungarian Academy of Sciences) - Fábian, Szilvia (Hungarian National Museum) - Hajdu, Tamás (Department of Anthropology, Eotvos Lorand University, Budapest)

Presentation Format: Oral

Excavation and interpretation of prehistoric multiple burials are challenge for both archaeologists and anthropologists. The comprehensive analysis of such sites can be entirely based on systematic recovery and on the application of specific analytical methods due to the lack of written sources from this era. In our work we would like to reveal possible reasons and the processes of formation of multiple burials in a certain historical period. A burial pit from the Copper Age recovered at Balatonszentgyörgy in 2017 was chosen as a starting point of a comparative analysis. The burial representing commingled remains with the minimum number of 17 individuals witnessed a typical phenomenon of this era. In forensic science the study of taphonomic factors of human remains within a mass grave or a multiple burial is a critical point to determine the disturbance and the nature of the grave itself. In our case we would like to perform a complete assessment of the taphonomic parameters, and the funerary behavior and study human remains with cross-referencing the anthropological data with the spatial and stratigraphic information. These data will be compared with other contemporary sites to reveal differences and similarities regarding this special kind of human activity.

4 ACTS OF WARFARE OR RITUAL VIOLENCE IN THE HUNNIC PERIOD FROM THE HUNGARIAN PLAIN

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Presentation Format: Oral

In the archaeological material of the Hungarian Plain the human remains from Roman-time settlements have been the subject of debate for a long time. These remains may be mostly connected to the very last horizons of the Roman-time Barbarian (Sarmatian) settlements, i.e. to the so-called Late Sarmatian – Hunnic period. This paper discusses some of such assemblages, which are linked together by the chronology (end of 4th – first half of the 5th c. AD) and the geographical proximity (Middle Tisza-region). However, the anthropological assemblages differ in their main characteristics.

In one case, remains of three individuals were found in a former storage pit, which contained also a large number of more-or-less whole vessels. Skulls of all three individuals wore unequivocal signs of perimortem trauma. In another case, complete skeletal remains of nine further individuals were scattered in different parts of a contemporary settlement. Large quantity of burnt debris and rich pottery material in secondary position prove that the last phase of the Roman-time settlement suffered severe destruction. However, the anthropological material does not show an undoubted picture of their possible violent death.

Here we are going to discuss the possible interpretations of these settlement materials with the help of refitting methods of the pottery, using GIS-technology and scatter patterns which can help to decide whether these features may be treated as signs of individual lethal violent acts, or a decisive phenomenon in the life of these settlements. At the same time, the anthropological material and trauma investigations of these possible murder victims should be also discussed.

5 INTERPRETING THE EARLY NEOLITHIC MASS GRAVE OF HALBERSTADT: VICTIMS OF CAPITAL PUNISHMENT?

Author(s): Meyer, Christian (OsteoARC - OsteoArchaeological Research Centre) - Knipper, Corina (Curt Engelhorn Centre Archaeometry gGmbH, Mannheim) - Nicklisch, Nicole (State Office for Heritage Management and Archaeology Saxony-Anhalt, Halle; Center of Natural and Cultural Human History, Danube Private University, Krems) - Münster, Angelina (Institute of Anthropology, University of Mainz) - Kürbis, Olaf - Dresely, Veit - Meller, Harald (State Office for Heritage Management and Archaeology Saxony-Anhalt, Halle) - Alt, Kurt (State Office for Heritage Management and Archaeology Saxony-Anhalt, Halle; Center of Natural and Cultural Human History, Danube Private University, Krems; Integrative Prehistory and Archaeological Science, University of Basel)

Presentation Format: Oral

In the Early Neolithic mass grave of Halberstadt, Germany, which was recently analysed by the authors, the skeletal remains of at least nine individuals were found. The remains were incomplete due to several taphonomic factors but all surviving cranial elements showed at least one perimortem blunt force trauma. In addition, postcranial elements also showed perimortem fractures that occurred before deposition in the irregular mass grave. This firmly points at collective violence as the reason for the existence of this mass grave. The detailed analysis of the demographic profile of the victims, the manner of their deposition, the patterning of their injuries and their isotopic signatures suggest a context different from previously known mass grave sites of the same culture, the Linearbandkeramik (LBK). The victims were almost exclusively adult men who, according to the results of the strontium, carbon and nitrogen isotope analyses, were non-local to the site. The cranial injuries clustered tightly at the back of the head, probably indicating controlled execution of immobile prisoners rather than a chaotic massacre which was proposed for other, contemporaneous sites. To understand the mass grave and the specific context in which the apparently organized application of lethal violence occurred, current knowledge about other sites of LBK regular burial, ritual and collective violence has to be included in the interpretation to possibly differentiate between sanctioned violence via capital punishment or non-sanctioned "criminal" violence. It also becomes clear that a reference point for "sanctioned" and "non-sanctioned" violence has to be defined, as the roles of perpetrators and victims most likely were fluid in prehistoric times without a centralized government but with numerous independently acting groups of varying goals, size and influence.

6 DIGITAL TRAUMA ANALYSIS AND THE MECHANISM OF WEAPON RELATED INJURIES: THE BRONZE AGE HUMAN BONES FROM THE TOLLENSE VALLEY

Author(s): Harten-Buga, Hella (Free University of Berlin, Institute of Prehistoric Archaeology) - Brinker, Ute - Jantzen, Detlef (State Authority for Culture and Preservation of Monuments, Mecklenburg-Western Pomerania, State Archaeology, Schwerin) - Nikulka, Frank (University of Hamburg, Archaeological Institute Pre- and Protohistory) - Orschiedt, Jörg (Free University of Berlin, Institute of Prehistoric Archaeology; Curt-Engelhorn-Zentrum Archäometrie, Mannheim)

Presentation Format: Oral

The discovery of around 12.000 bones with numerous injuries as well as various weapon finds in the Tollense Valley in Northeast Germany hint at an armed conflict of unusual scale dating to ca. 1300-1250 BC. Among the lesions, stabbing and projectile traumas dominate. Funded by the German Research Foundation (DFG) since 2017, the research project "Palaeomechanical investigations concerning the coherence of injury patterns and weapon efficiency on the basis of Bronze Age human bones and weapons", has engaged in the trauma analysis.

The injuries correspond to a range of late Bronze Age weapons found in the valley including wooden clubs and numerous flint and bronze arrowheads. Digital microscopy, micro-CT imaging and digital weapon matching were carried out, to obtain information about internal and external modifications of the bone structures caused by weapon related trauma as well as for the use-wear analysis of the weapons.

Case studies, focusing on the characterization and differentiation of the wounding characteristics and the weapon efficiency, demonstrate the benefits of high-resolution imaging and 3D-reconstruction combined with digital simulations of the mechanism of injury.

The data thus obtained will be used for the development of diagnostic criteria for the differentiation of specific injury patterns. With this suite of non-invasive methods we aim to help in reconstructing prehistoric interpersonal conflicts and also to exchange data for the analysis of injuries with Forensic Science.

7 "LOS RICOS TAMBIÉN LLORAN". INTERPERSONAL VIOLENCE AND CRIMES IN A MEDIEVAL COMITAL FAMILY

Author(s): Brunetti, Ester (Università degli Studi di Trieste; Accademia Jaufré Rudel di studi medievali - Gradisca d'Isonzo) - Cavalli, Fabio (Accademia Jaufré Rudel di studi medievali - Gradisca d'Isonzo; Research Unit of Paleoradiology and Allied Sciences, LTS-SCIT, Azienda Sanitaria Universitaria Integrata, Trieste)

Presentation Format: Oral

During the renovation works inside the Church of San Giovanni di Prata in Pordenone (Pordenone, Italy) numerous floor graves have been found, some of which were polysome. All the burials dated between the second half of the 13th century and the end of the 14th century. The stratigraphical evidence and the historical-documental integration made it possible to identify that these graves belonged to a Ghibelline family with a relevant territorial power: the Counts of Prata di Pordenone.

The bioarchaeological analysis of the remains, referring to a total of 62 individuals, highlighted in a female subject a case of probable homicidal violence characterized by sharp force trauma in the right forearm, as defensive injuries, and cutting injuries in the right orbit and in the right frontal bone. Furthermore, in a group of later graves, fatal lesions were found from edged and bladed and throwing weapons, probably military ones. In particular, a male subject presented a large cranial wound by a crossbow dart, whose metal tip was found in the burial.

8 WRAPPING THE DEAD OVER THE CENTURIES: A FORENSIC MULTIDISCIPLINARY APPROACH TO UNDERSTAND POSSIBLE CRIMES

Author(s): Barone, Pier Matteo (American University of Rome; Forensic Geoscience Italy)

Presentation Format: Oral

Over the centuries, "wrapped" bodies were buried in different contexts: cities, cemeteries, countrysides, houses, forests, churches, etc. This was related to different reasons: ritual, worship, social status, etc. However, sometimes, this was necessary to hide a "crime scene": violent death, homicide, tortures, etc. Even the "wrapping" material could change depending on what you wanted to conceal: fabric, bricks, concrete, lead, etc.

Although this habit is quite well known to law enforcement in modern crime scenes, it was not so obvious in the past. This work presents some "wrapped" scenarios of suspicious burials, assimilated to modern cases thanks to the use of new archaeological surveys and analyses, such as 3D surface acquisition, GIS, GPR modelling, and stratigraphical excavation of the burial sites, increasing the initial information value. New technologies allow to get more information on past killings and possible murder practices and offer a better understanding of archaeological "wrapped crime scene".

9 FATAL INCIDENT OR TAPHONOMY EFFECT - 3D IMAGES AND BIOARCHAEOLOGICAL CHARACTERISTICS OF MEDIEVAL NOMAD BURIAL

Author(s): Menshikov, Maxim - Dobrovol'skaya, Maria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Barrow group Fontan is one of the numerous burial sites in the Northern Black Sea area and the steppe regions of the European Russia. These sites are associated with the traditions of the Turkic tribes. Burials of this kind are well known and dated by XII-XIII AD. Numerous grave goods are typical for this funeral rite. The location of the items is strictly defined and had not been disturbed in our case. All accompanying objects (weapons, parts of the horse's body) were placed on their original locus. The nomad was buried according to all the traditions of the local tribe of that period.

The distinctive feature of this burial is the presence of an iron chisel in the area between the ischial bones. There were not visible signs of damage on the ischium, pubic bones, and sacrum. The pelvis was oriented at the right angle to the body horizontal. Tibias, fibular bones and feet bones were located very close together. This circumstance indicates to the feet wrapping. All these patterns add difficulties for the explanation of the reason why object appeared to be in the body. The photogrammetry allowed to make a three-dimensional image of the skeleton in order to reconstruct taphonomy changes of the pubic bones position. The body perimortem posture assumed as well. Presumably the cause of man's death was a fatal incident. Its possible forms are discussed in the presentation. Thus, the position of the metal object cannot be explained by ritual funeral actions.

10 SLAYING A VAMPIRE WITH SCIENCE- ANALYSIS OF THE SKELETAL REMAINS FROM KAMIEŃ POMORSKI

Author(s): Drath, Joanna - Arciszewska, Joanna - Szargut, Maria (Pomeranian Medical University) - Machalski, Grzegorz - Holicki, Mariusz (West Pomeranian Oncology Center) - Kurka, Grzegorz (The Museum of History of Kamień Pomorski Land) - Parafiniuk, Mirosław - Ossowski, Andrzej (Pomeranian Medical University)

Presentation Format: Oral

In July 2014 in a small city of Kamień Pomorski in north-west Poland, a skeleton was found during archeological digging on the grounds of a medieval cemetery. That particular skeleton drew attention of the scientists as it was buried outside of the cemetery land. Moreover it manifested peculiar lesions on left leg bones in a form of drilled holes. The international press reported that finding as another vampire burial and initial anthropological analysis conducted by a cultural anthropologist stated that remains belonged to a young male, whose appearance caused fear among his community, resulting in postmortem anti-vampire body treatment. Lately an interdisciplinary team of scientists from Pomeranian Medical University in Stettin, undertook a thorough examination of the "vampire's" bones. In our research macroscopical, molecular and radiological methods were applied. Our results showed that the skeleton belongs to a female, age over 60 years at the time of death. She was of a European biogeographical origin, belonging to a haplogroup H. The traumatic circular lesions on her left leg bones were done when a woman was still alive, shortly before her demise. There are slight signs of healing on the bones, as well as osteomyelitis formation visible on CT scan images. The radiocarbon dating places the remains in between seventeenth and eighteenth century. Considering all our results, we reject the "vampire" theory as the explanation of the skeleton's history. Furthermore, we raise an alternative hypothesis that the skeletal remains could belong to a witch-hunt victim who had been tortured before her death.

- 11 DISSECTED AND DITCHED - A LATE IRON AGE CRIME VICTIM FROM SAXONY, GERMANY**
Author(s): van der Burgt, Patricia (Landesamt fuer Archäologie Dresden)
Presentation Format: Oral
- Near Wiedemar in Germany, an extraordinary burial of a male person was documented in 2007. The skeleton was radiocarbon dated to the late Iron Age (200-100 BC).
- The skeleton was found directly underneath the top soil, in a pit which was too short and too shallow to be interpreted as a regular grave. Both arms were lying under the torso, and the skull was lying in a short distance to the left of the torso. The body was probably also fully disjoined at midsection: a clear gap was observed between two lumbar vertebrae. The left leg was extremely flexed, the right leg less severely so. The overall situation looked like as if the beheaded person was buried lying on his back in a squatting-like position. Several bones show severe perimortem injuries. In combination with the manner of body disposal it is suspected the victim was murdered.
- All bones with trauma were 3D-scanned to assess the amount of single slashes and blows. All weapons marks were microscopically assessed to detect and document microtraces and maybe find further clues to determine the types of weapons used.
- The results of all research methods as well as a suggested reconstruction of the sequence of events will be presented and discussed.
- 12 NORDIC BRONZE AGE MURDER?**
Author(s): Bergerbrant, Sophie (Department of Historical Studies, Gothenburg University) - Molnar, Petra (Crime Scene Investigator, Forensic Anthropologist, Forensic Unit, Swedish Police Authority, Stockholm)
Presentation Format: Oral
- How do we distinguish prehistoric violent deaths from each other? What is the difference between a ritualistic killing and a death in warfare or a cold-blooded murder? This paper aims to discuss the human remains found in a bog in Everöd parish, southern Sweden in 1866. The skeleton exhibits evidence of extreme violence in the form of multiple blunt force and sharp force injuries, as well as signs of defleshing. The skeletal material has been radiocarbon dated to the Late Nordic Bronze Age (1100-500 BC). The mode of the depositional practice of the human remains will be compared with other cases of violent death from the Nordic Bronze Age and pre-Roman Iron Age, such as the ritual killings evident in bog bodies. Based on the anthropological investigation, circumstances surrounding the killing and treatment of the individual who ended up in a bog in Everöd will be presented and form the basis for a discussion regarding the type of death witnessed here. Is it an example of a society-sanctioned ritual, the result of violence in warfare or a case of Bronze Age murder?
- 13 A HOLISTIC APPROACH TO IDENTIFICATION OF WAR VICTIMS. A CASE STUDY OF THE BATTLE OF TORMERSDORF (1813)**
Author(s): Zawadzki, Pawel (Fundacja "Łużyce - wczoraj i dziś") - Pokutta, Dalia (Archaeological Research Laboratory University of Stockholm) - Konczewska, Magdalena (University of Wrocław, Institute of Archeology) - Szczurowski, Jacek - Konczewski, Paweł (Wrocław University of Environmental and Life Sciences, Department of Anthropology)
Presentation Format: Oral
- The Battle of Tormersdorf (then Saxony, modern-day Poland) that took place on 24 May 1813, is among many episodes of the Napoleonic Wars. Lasting for several hours struggle between French cavalry and Russian Cossacks resulted in deaths of a dozen soldiers on both sides. Based on historical records we know that fallen soldiers have been buried nearby the battlefield, in a forest south to the village.
- During WWII, in 1945 residents of Tormersdorf were expelled and the village was completely destroyed. In recent years extensive archaeological surveys of this area have been undertaken by the authors of this study. The main aim was to investigate the cultural and natural heritage of this region, as well as the human-environmental relationship in the past. As a result, among others, the authors discovered the location of the battlefield and graves containing the remains of three fallen soldiers.
- In this presentation, we will discuss key issues relating to localization of burials in the woodland environment. We focus on a holistic meta-analysis of sources that are helpful not only in a field survey but also in identifying people buried in them. The key problem seems to be related to the fact that the soldiers' identity was unknown to the local people who buried them, therefore regardless on which side they were fighting on, this complication existed already at the time of their internment. Our methodological approach enables a new, creative approach to these issues, and includes historical research, remote sensing and geophysical survey, archaeological excavations, anthropological assessments, and multi-isotopic and genetic analysis.
- 14 WORLD WAR II EXHUMATION OF GERMAN SOLDIERS IN FRANCE AND CROATIA**
Author(s): Gassend, Jean-Loup (Centre universitaire romand de médecine légale - Lausanne)
Presentation Format: Oral
- During World War two, approximately 25 million soldiers lost their lives, including more than 4 million Germans, many of which are still buried on the battlefields where they were killed. Large numbers of bodies are therefore currently being exhumed every year by the German war graves commission (Volksbund Deutsche Kriegsgräberfürsorge) to be identified and reburied in official cemeteries. This underfunded organization has a huge task, that does not include archaeological excavation or anthropological

analysis of the recovered remains. Therefore, excavations are often performed in a rushed manner and the bones are reburied without any form of anthropological examination. This is unfortunate, as the human remains often present various kinds of trauma and fractures, and even signs of medical interventions. In the cases where bodies can be identified, e.g. with their identification tags, observed injuries can be compared to the cause of death which was given to family members or which was listed in the soldier's military file. This paper presents several cases of observations made on German soldier's remains recovered in France and Croatia over the past years.

15 FORENSIC CONTRIBUTIONS TO TRUTH-SEEKING IN POST-FRANCO SPAIN: THE CASE OF CASTUERA'S CONCENTRATION CAMP

Author(s): Muñoz-Encinar, Laura (University of Extremadura; University of Amsterdam)

Presentation Format: Oral

Forensic work in Spain has strived to become a tool for truth seeking, as national and local institutions have engaged with different politics of silence throughout the decades. Forensic experts have helped to elucidate the history and identity of thousands of left-wing Republicans killed by Francoist groups. Their work has also revealed new empirical data about the functioning of distinct sites of terror that have remained elusive in the official paper trail and in the collective memory of some communities. This is the case of the concentration camp located in the village of Castuera, in the region of Extremadura, which held over 20,000 detainees between 1939 and 1940. The Camp served new Francoist authorities to administer the large number of civil and military prisoners captured at the end of the war. It was also the site of numerous deaths due to disease, torture, hunger and/or execution. This presentation will examine, from a forensic perspective, the concrete ways in which archaeological findings compiled during the excavation and exhumation of two mass graves contributed to the development of new historical facts about the Francoist repression of political prisoners. Providing a detailed insight into the workings of the forensic method in the Spanish context, I show how the scientific record becomes fundamental in deciphering the act of killing, the context of the execution, the perimortem and postmortem treatment of prisoners, and the profiles of the executed and the perpetrator.

A. CASE REPORT: FORENSIC ANTHROPOLOGICAL CONTRIBUTION IN A POSITIVE IDENTIFICATION OF THE SECOND WORLD WAR VICTIM FROM A CLANDESTINE MULTIPLE GRAVE

Author(s): Drath, Joanna - Kubaszewska, Joanna - Arciszewska, Joanna - Cytacka, Sandra - Szargut, Maria - Zielińska, Grażyna - Bykowska-Witowska, Milena - Piątek, Jarosław - Parafiniuk, Mirosław - Ossowski, Andrzej (Pomeranian Medical University)

Presentation Format: Poster

In September 1939, during the battle of Zambrow, around 400 Polish soldiers fell to their deaths. Many of them remain unidentified and their graves are yet to be uncovered. Upon the request of the Mayor of Zambrow, the exhumation was performed in a suspected multiple clandestine grave so as to identify and rebury one of the Polish soldiers, whose family was still waiting for closure. During the exhumation process participated specialists from various disciplines: historians, archaeologists, geneticists and an anthropologist. The main identification process was undertaken by scientists from the Pomeranian Medical University and the Polish Genetic Database of Victims of Totalitarianisms. Two sets of skeletal remains were found in the grave, and the study goal was to identify which of them belonged to a missing soldier. Anthropological analysis revealed that one skeleton belonged to a person that was between 25-30 years old at the time of death, the other one was between 30-35 years at death. Thus, anthropological analysis excluded one person from further molecular analyses, and the rest of the identification process focused on the remains of the older person. The final molecular results showed that bones that belonged to a male 30-35 years old are the bones of our missing soldier. This case shows that forensic anthropology may be of great importance in a positive identification process even in cases that are nearly 80- years- old.

B. IN THE TIME OF VIOLENCE. PERIMORTEM CRANIAL TRAUMAS FROM ROMAN NORTHERN GREECE: A CASE STUDY

Author(s): Kalliga, Eleni - Svoli, Athanasia - Papageorgopoulou, Christina - Aidonis, Asterios (Laboratory of Physical Anthropology, Democritus University of Thrace) - Ziota, Christina (Ephorate of Antiquities of Florina)

Presentation Format: Poster

A case study of two subadults from the Northern Greek cemetery in Mavropigi Kozani, dated to the Roman period, showing evidence of perimortem cranial traumas is presented. Macroscopic and microscopic analysis was conducted, along with x-rays, in order to eliminate the possibility of pseudopathology and examine the traumas for evidence of healing and cut marks. Sex assessment of the subadult individuals was conducted using a combined method, of dental measurements and the morphological characteristics of the mandible and the pelvis. Age was estimated from the dental development and the stage of epiphyseal closure. One individual has a sharp force cranial trauma in a crescent shape, probably by a bladed weapon. The other has a penetrating, circular trauma on the frontal bone, probably by a projectile weapon. The traumas show no signs of healing. The two children were closely buried in a cluster with five other individuals (two subadults and three adults) with no clear signs of interpersonal violence. It is possible that the two children, if not all the individuals buried in the cluster, were the victims of a single violent episode during the turbulent roman times in Macedonia.

Theme: Archaeological theory and methods beyond paradigms

Organisers: Meier, Thomas (Heidelberg University) - Babić, Staša (University of Belgrade) - Bausch, Ilona (Kokugakuin University)

Format: Regular session

In our eyes over the last decades archaeology turned into a rather a-political mode and lost sight of questions of power, inequality and exclusion. Also sessions at the EAA have more and more turned into the empiricist and positivist branch of the archaeological discourse. We are convinced that this development is a fundamental threat to the discipline of archaeology. With an (assumed?) loss of political aspiration it turns irrelevant for society and becomes prone to abuse by groups from the political fringes. With this session we want to counter this development and revive the experimental societal playground the EAA has been in its early years.

For this session we invite papers presenting novel approaches, interpretations and theories – also at an early stage of development – which question, counter and negate the disciplinary mainstream, provoke questions and contradictions and – most of all – raise controversial questions of power, politics and society. The ideas of Michel Foucault and Judith Butler, the critical theory of the Frankfurter Schule or Hayden White may form one, but surely not the sole source for rethinking the potential social/political charge of the discipline. There are no limits to region or period and papers on novel interpretations of past societies are as welcome as critical investigations in the conduct and discourse of the discipline. But we definitely require a firm theoretical stand and a considerable level of reflexive criticism!

ABSTRACTS

1 GOVERNING SERBIAN AND BOSNIAN ARCHAEOLOGY: A POST-CONFLICT COMPARATIVE PERSPECTIVE

Author(s): Milosavljevic, Monika (University of Belgrade, Faculty of Philosophy, Department of Archaeology)

Presentation Format: Oral

The archaeologies of Serbia and Bosnia and Herzegovina share their same institutional roots in both the former Kingdom and Socialist Republic of Yugoslavia. The collapse of the latter resulted in a multitude of individual archaeologies, while similar and disparate form one another, still stemmed from one source. On these foundations, these countries' archaeologies have been constructed. Albeit intertwined with interpreting the past in a historical context, they are not yet liberated of the "identity" question, which is just one problematic thread of a multitude in the post-conflict context for archaeology. The limitations facing the practice of archaeology thereof within Serbia and Bosnia Herzegovina must be investigated as to establish what pressures exist in a political context defining the area in which archaeology is allowed to function. The issue concerning the intersection of archaeology and politics is the aim of this presentation, in which my proposed analysis gains from a Foucauldian perspective of governmentality and an attuned sensitivity for political post-conflict. The former can be seen as the "art of government" and the "conduct of conduct" as well as an assemblage of forces and practices that make reality open to political or other interventions. In Foucault's words, these techniques are interrelated, disciplining norms and processes that govern the conduct of populations. Reflected then this concept is in the main hypothesis, wherein informal aspects of archaeological function in the Western Balkans, remaining predominant in comparison to their legal frameworks as set against international professional standards. As a consequence, the knowledge production created thereof results in an identity construction and treatment of respective and mutual cultural heritages as unpredictable, leading to unscientific foundations. As such, it leads further to the degradation of archaeology as a profession and simplification of identity constructions.

2 ARCHAEOLOGICAL REALITY IN GREECE: AN AUTOETHNOGRAPHIC APPROACH

Author(s): Daravigka, Klea (Aegean University, Lesvos)

Presentation Format: Oral

In the broad theoretical spectrum of archaeological ethnography, autoethnographic endeavors are generally scarce and, in Greece, totally absent. The approach is considered at least controversial by the small group of academics and others who are actually acquainted with the term. The research combination of social and political issues with personal experiences, the emphasis on the narrative form and the immediate address of the "researched-researcher", deconstruct theoretical dualist oppositions of art versus science or objectivity versus subjectivity and provoke fundamental epistemic principles.

Archaeological reality in Greece is complex, historically charged and always driven by national strategies. As such, describing it is not an easy task. Experiencing it though, through the eyes of a contract archaeologist, has a high affective -and as such scientific- impact that dictates its narration. Merging the ideas of (self-) reflexive critical inquiry with the notion of "continuous experience" as political intervention, I will attempt to comment on aspects of precariousness, exclusion and confrontation in modern Greek archaeological reality, defined both by institutional settings, as well as tacit scientific notions and ideology: apprenticeship, manual labour, amateurism and at the same time professionalization of archaeology, are just some of contract archaeologists assigned values that paralyze their social and scientific entity.

My autoethnographic attempt does not intent to represent Greek contract archaeologists as a unified social subjectivity, but

rather at mobilising alternative forms of action in the present.

3 FORGET ABOUT FACTS!

Author(s): Meier, Thomas (Institute for Pre- and Protohistory and Near Eastern Archaeology, Heidelberg University)

Presentation Format: Oral

The idea that empirically observable facts allow to recognise an objective truth was mainly invented in the context of Christian theology in 17th-century western Europe. Although enlightenment had driven out the Christian god from academia and although idealism and constructivism have frequently disproved the objectivity of facts and the recognisability of truth, academia has hardly questioned these concepts or made any attempts to ground truth and empiricism on new fundaments.

Today's accuse of post-factualism emphasises that aberrant ways of argumentation deny the logical structure of empiricism, but at the same time overlooks that these alternative logics still argue along the idea of facts. Thus the term "post-factual" is misleading, because the dissonance is not on the sheer existence of facts, but on the plausibilities of their interpretation. What's shocking in post-factuality is the dissolution of established intersubjective standards in favour of an arbitrary and solipsist declaration of reality. Post-factuality negates fundamental consenses on which societal coherence in general and especially in academia are based, it negates discourse (sensu Habermas) as the only legitimate means of societal dispute and it negates that all humans are fundamentally equal in their abilities of understanding.

The actual post-factual battle is a strive for hegemony in the facts-discourse. It is a political and ethical decision whether we prefer the intersubjectivity of empiricism as a common ground of societal coherence or the autocratic and hegemonial claims of individual despotism. Thus post-factualism is primarily a political problem. The battle between factualism and post-factualism, however, blinds out that the idea of "facts" in itself is a specifically modern and western European way to produce absolute truth, to reduce contingency and to silence divergent argumentations. The notion of facts itself already establishes inequality between actors of different world-views.

4 CAN AGENTIAL REALISM FUNCTION AS RIPOSTE TO POSITIVIST ARCHAEOLOGY?

Author(s): Miller Bonney, Emily (California State University Fullerton)

Presentation Format: Oral

The organizers of the session rightly bemoan the positivist tilt of some recent archaeological discourse at the EAA. One troubling aspect of this trend is the dualist assumption that underlies positivist thought. In this view agency resides solely in humans who manipulate inanimate objects and materials to achieve certain ends. Theoreticians (e.g. Latour, Ingold) have pushed back against this hierarchical structuring of the world. Barad's agential realism (2007) explicitly rejects privileging the human or animate, acknowledging the inherent dynamism and instability of the material world. For Barad matter is in motion and thus inherently agential. The world is always becoming; determinacy results from practice. Analysis and the array of materials or apparatuses applied to a thing create the meaning of that instantiation. The human is part of the phenomenon that generates the discourse not a separate entity looking down at something that represents a particular content. Identity is not fixed. Barad points to the work of physicist Niels Bohr for the proposition that whether one concluded an electron was a wave or a particle depended on the method of measurement. Alberti and Marshall (2014) introduced Barad's (2007) agential realism into the archaeological discourse for the power of her ontology, dissolving the barrier between different bodies and envisioning an ontological unity that empowers us to interrogate the world of artefacts in quite different ways. But some feminist theorists have critiqued Barad for incompletely eliminating a masculinist perspective. This paper revisits Barad's argument, applying agential realism to the analysis of a group of gynomorphic vases from Early Bronze Age Crete. The paper argues that the supposed residual masculinism is illusory and that agential realism permits a more open-ended reading of the pots that contributes to the political thrust of archaeology and provides a way of communicating with the broader world.

5 "IT'S CURIOUS HOW OFTEN YOU HUMANS MANAGE TO OBTAIN THAT WHICH YOU DON'T WANT." CHALLENGING INTERPRETATIONS OF PREHISTORIC COMMODITIES PROCUREMENT

Author(s): Sosic Klindzic, Rajna (Faculty of Humanities and Social Sciences University of Zagreb)

Presentation Format: Oral

Archaeological interpretation reflects our mental image of the past. It is often the image of the development of human society formed in antiquity, defined by Rousseau and widely accepted during 19th century, that we accept as a fact. It is especially common for the archaeological interpretation of objects of everyday use. The artifacts of everyday use are often taken for granted and are rarely subject of more detailed inquiry into human behaviour, as if only the luxurious and rare objects were evidence of social complexity. Even when attempt towards recognition of complexity is made, it is often through the prism of religious feelings of prehistoric people manifested in their material culture. Additionally, scientific analyses of artifacts leaves us with the illusion that the results are objective and conclusive. So, we form our interpretation around the assumption that people in prehistory were simple, rules abiding, deeply spiritualistic, guileless yet always rational and very adaptive peasants. This narrative is periodically challenged in archaeology, as recently by Graeber & Wengrow in "How to change the course of human history". In other disciplines it is already recognised that "primitive man"; is an ethnocentric projection, rather than (yet another projection) homo economicus from prehistory. We often fail to acknowledge that we are not just biologically same as prehistoric homo sapiens sapiens, but that our intellectual capacity is the same and that archaeological record is evidence of very complex behaviour, both

on individual and communal level. We have to start to observe prehistoric people as our intellectual peers not just in big synthesis or theoretical papers, but on every level of archaeological interpretation to build new theories. In this paper I will confront my previous work and on Neolithic raw material procurement and "economy"; with other possible scenarios rather than through the cliché of adaptive strategies.

6 THE POLITICS OF WHAT WE KNOW

Author(s): Niculescu, Gheorghe Alexandru (The Vasile Pârvan Institute of Archaeology; The New Europe College)

Presentation Format: Oral

The empiricists, who claim value-free knowledge is attainable, and many of those who want an archaeology sensitive to current political issues share a reflexivity deficit which makes them embrace, tacitly or openly, representations that are not products of scientific research and have the authority of the political. The work on the history of the discipline during totalitarian regimes shows what happens when political representations, not scientific theories, are at work, but that does not discourage those who assemble theories by borrowing from prestigious intellectual sources, without inquiring about the reasons of their authority, and employ them as something that cannot be changed by anything that archaeologists might find. Using, among others, Pierre Bourdieu's arguments for disciplinary autonomy and Andrew Abbott's assessment of the relation between the empirical and the normative in current sociological research, the paper will examine the political relevance of the research on ancient ethnic phenomena and its uses.

An active involvement and an appropriate answer to those who expect from us something else than what they already know should put the present into the perspective of our knowledge about the past, in discipline focused on what we can learn from the research on material remains, not on recycling appealing theories. In order to achieve that, we have to avoid imagining the past from the perspective of a present that is not a product of a scientific construction in which we are involved. And this becomes possible by examining the choices that were made for us, in the local traditions of research in which we were educated, and the relations between these and our own choices.

7 "WEST VS. EAST". THE INTERPRETATION OF CULTURE MATERIALS IN THE ROMAN EASTERN PROVINCES ARCHAEOLOGY

Author(s): Ahmad, Tarek (Institute of Classical Archaeology, Free University Berlin)

Presentation Format: Oral

In recent years, many studies have been focusing on the interrelationship between cultures within the Roman archaeology from "the West vs. East" perspective. The archaeological studies of the ancient Near Eastern, especially during the Roman period, have mostly applied historical and archaeological methods in their interpretation of culture materials, which are essentially based on the attempt to distinguish between local / indigenous / native (mostly Hellenized) and colonial (Roman) cultures contextualizing the reciprocal cultural influences (e.g. Aliquot 2009; Ball 1999). These methods have led to concepts like Hellenization and Romanization, in which cultural production has been viewed through the lens of Roman colonialism and cultural superiority. On the other hand, the interrelationship between "Roman" and "local" cultures is sometimes presented as a "West vs. East" cultural conflict. In my opinion, such concepts mislead our attempt to investigate the mechanism of the absorption of the Eastern geographical areas and their cultures within the Roman Empire. Furthermore, they back historical arguments around contemporary political manipulation, in which Roman culture represents the "West" and the local indicates the "East".

Although some researchers have investigated the impact of Roman Imperialism on the cultural environment in Roman "Near East" via different perspectives (Andrade 2013; Newson 2015; Sommer 2005), concepts like Hellenization and Romanization - as representatives of "Western Culture" - still dominate. This proposal paper aims to criticize this traditional disciplinary mainstreaming of the Classical Archaeology (Roman-Provinces), and tries to propose the application of other social concepts, including the hybridity and the ethnicity, which are developed in the 20th century postcolonial theory (Bhabha 1994; Jones 1997; Young 1995), as alternative methods to investigate the mechanisms of Roman imperialism in Eastern provinces.

8 A BORDERLAND PERSPECTIVE AS CRITICAL ARCHAEOLOGY

Author(s): Gardner, Andrew (UCL Institute of Archaeology)

Presentation Format: Oral

A major feature of the contemporary world is re-bordering. The promise of a 'borderless world' in the 1980s and 1990s, at the height of globalization theory in the academy, has disappeared, met with a substantial political backlash all around the world. From Brexit to Brazil, from 'Amexica' to Australia, control of borders has become a clarion call of the populist right, mobilising deep-seated prejudices, and concepts of national identity, often themselves rooted in the archaeologies of earlier generations. Invocations of such territorial boundaries frequently intersect with a sharpening of other social boundaries, dividing classes, generations, and groups of differing educational backgrounds. In academia, across a number of disciplines, the field of 'border studies' has expanded dramatically in recognition of this situation. Clearly, globalization has not been a universally-positive phenomenon, but the regressive nativism of many current political movements must be challenged. In performing a critical role in these debates, archaeologists can position themselves at the borderlands, both metaphorically, and in their research foci. Borderland narratives generally reveal the complexities of human interactions, and provide a rebuttal of simplistic ideas about the permanence, and impermeability, of walls, fences, and hard borders. They show that, far from separating groups into 'natu-

ral' divisions, borderlands are generative of precisely the transformations that can disturb social norms. Changing attitudes to such effects would be a worthy mission for a critical archaeology in the 21st century, and this paper will use examples from the ancient and modern borderlands of Britain to argue how this might be achieved.

9 FASCIST HERITAGE AND ANTIFASCIST ARCHAEOLOGY

Author(s): Lerma Guijarro, Alma (Complutense University of Madrid; Palimpsests: anarchist archaeology and anthropology magazine; CRAS (Revolutionary center of social archaeology); Backset archaeology association)

Presentation Format: Oral

Currently, the rise of fascism in Europe and in the rest of the world is undoubted. However, democracies have kept alive the image of fascism through heritage. And this is where we should discuss these heritage issues. Should fascist monuments be allowed? Especially in consideration of the fact that fascism destroyed monuments from antifascist or other. Moreover, we must bear in mind how Heritage protects these fascist monuments, and how this determines who History belongs to. From where is it written books and landscapes, especially urban ones.

Nevertheless, there are some archaeologies developing against fascism, like anarchist archaeology, communist archaeology and different research whose main perspective is critical of fascist ideologies.

This speech revolves around what is and is not considered heritage, and how much time has to pass for something to be considered heritage. Because nobody would dare to deny that the monuments of ancient Roman Empire are heritage. Nevertheless, fascist monuments still hurt people's sensibility. Did the monuments of ancient Roman Empire hurt ancient people sensibility?

Even though my main proposal is to talk about this heritage issue through different research of Spanish and Italian fascist monuments, I'd like to stimulate debate around these issues.

10 ARCHAEOLOGY, NATURE, CULTURE, KROPOTKIN

Author(s): Babic, Staša (Dept. of Archaeology, Faculty of Philosophy)

Presentation Format: Oral

Throughout the history of the discipline, archaeologists have faced the challenge of disparate character of their record: remains of human activities in the past, embracing both "cultural" and "natural" phenomena. Various responses have been devised, from backing up archaeological inferences by the results gained from implementation of hard-science methods, to explicit embracing of epistemological norms of natural sciences. More often than not, these strategies have tended to downplay the social/political charge of archaeology, emphasizing the positivistic ideal of value-free knowledge. Furthermore, some recent theoretical arguments tend to flatten the ontology of humans and non-humans, with the aim of avoiding the nature/culture dichotomy and anthropocentrism of archaeology. It has been argued that the social engagement of the discipline is "flattened" at the same time.

The presentation aims to suggest that acknowledging the naturalistic concerns, or emphasizing the existence and materiality of the world regardless of interaction with humans, need not (should not?) necessarily dampen the importance of social issues in archaeology.

The example may be instructive of Peter Kropotkin (1842 – 1921), who observed the world not divided into nature/culture and studied animals, plants, humans and their interactions. Contrary to Darwin and Spencer, who both emphasized competitiveness and struggle, Kropotkin contended that the basic principle of survival is cooperation and that mutual aid has pragmatic advantages for the survival of both human and animal communities. His work is equally relevant today in the fields of biology, philosophy, ethics, politics and direct social action.

11 THE CENTRE CAN NOT HOLD

Author(s): Paludan-Muller, Carsten (Cambridge Heritage Research Centre)

Presentation Format: Oral

Archaeologists and heritage managers are finding themselves in a bewildering political landscape. It is the unsettled and unsettling landscape created by the ongoing seismic shifts in today's world. The end of a well-known world-order and an ensuing flux, in which a new order has yet to emerge and then coalesce, has repercussions felt at many scales of our lives.

How we experience the chaos obviously varies with who and where we are in the world. But most of us feel the strong pull away from a center of common ground on which a social contract can build. A contract that allow us to negotiate our interests and disagreements within a commonly accepted set of values and rules. Whether that social contract with its values and rules is (or was) just, and fair is another question. The point is that its erosion is generating an almost fractal roadmap for people to follow in their quest for identity and dignity.

The past has a particular role to play in this bewildering context. It may represent an (imagined) lost golden age, invoke memories of injustices suffered, and fuel political projects that promise a bright future, while pitting people against each another. But it may also help us better understand the chaos, by looking into other periods of shifting world order.

In this paper I will discuss conditions for navigating the fractured context and for offering meaningful interpretations of the past, without contributing to stereotypes of backward-looking fundamentalisms (political and religious) or sterile political correctness.

12 ARCHAEOLOGY: MAKING A DIFFERENCE TO GLOBAL DEVELOPMENT

Author(s): Holtorf, Cornelius (Linnaeus University)

Presentation Format: Oral

I agree with the session abstract that archaeology in Europe must not be apolitical or atheoretical. A critical perspective is of renewed significance today in the context of worrying links between cultural heritage and threats to the open society. However, I would like to argue here that archaeological politics and theory are developing continuously, and that today they should be open for new agendas and new forms, too. Of particular significance in contemporary society are questions of how archaeology can contribute to global development, not the least in relation to the Sustainable Development Goals agreed by the United Nations. We therefore need an archaeological theory that helps us relate specific archaeological practice to concrete goals in global societal development. Likewise, we need an archaeological politics that guides us in how to make a difference in society effectively. In the paper, I will discuss some relevant experiences from working in two different but related contexts, based on ongoing collaborations with the nuclear waste sector and with UNESCO.

13 POPULIST HERITAGE POLITICS AND THE POWERFUL IRRELEVANCE OF ARCHAEOLOGY

Author(s): Niklasson, Elisabeth (Stanford University)

Presentation Format: Oral

In the grand scheme of things, archaeology is politically trivial. We can bemoan misappropriations of narratives and sites at conference after conference, but archaeology will probably never be high on any political party's or governments agenda. We can initiate hundreds of inclusive community projects, but archaeology is never going to shift the tides of political opinion. It is dangerous to admit this. As funding for culture and the humanities is waning and advocates scramble to motivate the relevance of archaeology – either by jumping on the scientific bandwagon, by couching it in the cultural industry frame, or by stressing its positive emotive and edifying effects in times of crisis – recognizing the irrelevance of archaeology is like adding insult to injury. Still, this is where we must start if we seek to position archaeology in the political: because it is in its irrelevance the power lies. In this talk I explore how the triviality of archaeology can make it useful as a condition for the mobilization of heritage in nationalist-populist politics. Using examples from parliament proceedings and proposals by populist-nationalist parties in Europe, I suggest that by endorsing archaeology as a good-will project and as representing the “right” kind of heritage, parties can reinforce their arguments about European societies being caught in a ‘cultural struggle’, and fuel what Arjun Appadurai has called ‘predatory identities’. When used as a building block of cultural policy, this irrelevance can become a gateway to power. Since cultural policy is often less guarded by establishment parties than other policy fields, it can be a roundabout way to reach real targets like immigration policy. Finally, I address the tacit compliance of archaeologists and heritage professionals in situations when the political message is right (more money for archaeology!) but the sender is wrong.

172 TRANSITIONS IN AGRICULTURE: INTEGRATING ARCHAEOLOGICAL SCIENCES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Wright, Lizzie - Grau-Sologestoa, Idoia - Deschler-Erb, Sabine (University of Basel) - Livarda, Alexandra (University of Nottingham)

Format: Regular session

Agriculture has been the focus of the human economy in Europe for much of the past 9000 years and, as such, its evolution has been the subject of intensive research. The history of agriculture has been punctuated by a number of major transitions – from its initial adoption in the Early Neolithic, to the specialisations that occurred in the Late Neolithic to Bronze Age, and again from the Iron Age to the Roman period, from Roman times to the Early Middle Ages, and the remarkable innovations in Post-Medieval times. These agricultural transitions are inextricably linked to significant environmental, social, cultural and political changes that affected all aspects of human life. However, as historical and archaeological disciplines have become increasingly specialised, it is often very challenging to look beyond one's specific niche of interest and combine the different strands of evidence, while the integration of different archaeological disciplines (archaeobotany, zooarchaeology, geoarchaeology, genetics, etc.) is often key to our understanding of the driving forces behind these important processes.

This session aims to bring together archaeological scientists whose work focusses on agricultural transitions (for example in farming, animal husbandry, horticulture or arboriculture). We particularly welcome interdisciplinary papers which involve the integration of different scientific methods. Potential themes include (but are not restricted to):

- New research related to agricultural transitions
- Ways of characterising different agricultural transitions
- Links between agricultural and cultural transitions
- The causes and effects of agricultural transitions
- Challenges faced when integrating different lines of data
- Future directions for the study of transitions in agriculture

ABSTRACTS

1 THE LAKEBOS PROJECT: TRANSITIONS IN PREHISTORIC CATTLE HUSBANDRY IN SWITZERLAND

Author(s): Wright, Lizzie (University of Basel)

Presentation Format: Oral

The Neolithic period was a time of transition across Europe. Domesticated livestock animals, including cattle, were introduced and agricultural innovations spread across the continent. This spread is thought to have involved two dispersal routes: 1. along the Danube corridor and through central Europe, and 2. around the Mediterranean littoral, resulting in a continental route focussed on cattle husbandry and a coastal route focused on caprines. These broad husbandry patterns became embedded in these regions, and continued into the Bronze Age and beyond.

Switzerland is located in a pivotal position between the paths of these two routes, and the topography of the region, with the Jura mountain range in the North and Alps to the south means that there is natural a corridor through which their influences travelled and interacted. Additionally, it is also home to many well preserved and precisely dated prehistoric faunal assemblages, recovered from wetland contexts, which provide a rare opportunity to study early European agricultural change in unprecedented temporal detail. Cattle is the dominant domestic species in these assemblages, and has provided large datasets, suitable for this kind of analysis.

The aim of the LAKEBOS project is therefore to use prehistoric Swiss cattle remains to investigate the spread and nature of agricultural transitions in the area during this time. This paper will introduce the project and present some preliminary results.

2 LITHIC TECHNOLOGY DURING THE SPREAD OF FARMING IN THE WESTERN BALKANS

Author(s): Jovanovic, Ivana (Institute of Archaeology, University College London)

Presentation Format: Oral

This research presents an integral part of a doctoral research, set within the EUROFARM project (Transmission of innovations: comparison and modelling the spread of early farming and associated technologies in Europe), which studies the diffusion of farming across the western Balkans in the 6th and 5th millennium cal. BC, integrating different kinds of associated technological innovations: farming practices, landscape use, pottery and lithics. Production of chipped stone tools is one of the technologies practiced by both late forager and early farmers, and therefore represents an ideal feature for investigating potential continuity/discontinuity in lithic technology from the Late Mesolithic to the Early Neolithic, as well as during the entire Neolithic sequence. Changes in stone tool production can be determined by technological and/or cultural choices, including raw material procurement and use, knapping techniques, morphometric traits of main technological categories, and retouched tools.

This paper aims to investigate the role of lithic technology during the spread and local development of farming across the western Balkans (modern countries Serbia, Montenegro, Bosnia and Herzegovina, and Croatia), by assessing variability and/or standardisation in lithic technology. Having in mind that pressure blade production and its accompanying knapping techniques represent a key technological and cultural marker for identification of specialised production and mechanisms of technological and/or cultural transmission, special attention was given to the blade debitage, quantifying variation in size of blades. An interdisciplinary approach including multiple conventional and analytical techniques from archaeology, materials science, geology, and statistics is applied to the newly discovered and old museum lithic collections from the entire research area, which is also supplemented by re-evaluation of the literature. This will allow to observe lithic technology in small-scale areas: within sites; and within large-scale areas: geographical regions of the western Balkans.

3 LAND-USE TRANSITIONS IN TELL EŞ-ŞĀFI/GATH, ISRAEL, THROUGHOUT THE EARLY BRONZE TO LATE BRONZE AGE

Author(s): Frumin, Suembikya (Bar-Ilan University)

Presentation Format: Oral

Land-use transitions may be linked with local historical processes on one hand, and with external influences such as trade and human migrations on the other hand. Bronze Age Canaan represents a test case for studying land-use transitions and their causes. Geographically corresponding to the Southern Levant, Canaan was situated on the crossroads between physical and cultural elements of Europe, Asia and Egypt. At the same time, local geographical diversity also provided a basis for intrinsic variation in Canaanite agriculture and dietary preferences. Meanwhile, the plant-based Canaanite diet transformed over time, throughout the Early to Late Bronze Ages, as evidenced by new archaeobotanical data. This included replacement of the dominant wheat form, diversification of cultivated legumes, and increase in flax and grape production. In addition, the variation within the Canaanite diet that existed during the Early Bronze Age – between the western coastal plain and the eastern Jordan valley and Dead Sea – becomes blurred towards the Late Bronze Age. We address the relationship between internal and external factors that may correlate with these temporal and spatial changes, combining historical and environmental data.

4 LATE BRONZE AGE AGRARIAN INTENSIFICATION IN THE SOUTHEAST BALTIC

Author(s): Minkevicius, Karolis (Vilnius University, Department of Archaeology) - Podėnas, Vytenis (Lithuanian Institute of History, Department of Archaeology) - Urbonaitė-Ubė, Miglė - Ubis, Edvinas (Klaipėda University, Institute of Baltic Region History and Archaeology) - Kisielinė, Dalia (The Nature Research Centre, Laboratory of Quaternary Research)

Presentation Format: Oral

Agricultural history of the Southeast Baltic region developed in a way that was distinctively different from the more traditional European Neolithic transition. Last several years in Lithuanian archaeology have been marked by a sharp increase in projects focused on this topic. A reassessment and reevaluation of existing archaeobotanical and zooarchaeological evidence revealed that while animal husbandry was adopted by the Neolithic inhabitants of the SE Baltic, there is a lack of any firm evidence on farming predating the Bronze Age. Consequently, these studies have successfully challenged the concept of Neolithic farming in the region and revitalised the old debate.

This paper explores the arrival of farming in the SE Baltic in the context of agricultural intensification which took place across the Baltic Sea around the transition from the Early to Late Bronze Age. A recently excavated Kukuliškiai hilltop settlement in coastal Lithuania has presented a significant addition to the existing archaeobotanical record. Assemblages from Kukuliškiai expands our knowledge of the earliest crop packages and provides the earliest direct dates for several crop species in the region. New data allows us to better understand the beginnings and development of farming in the SE Baltic. Finally, it allows to further examine the impact of this technology on the social and economic development of the local communities.

5 ANIMAL HUSBANDRY IN TRANSITION: ECONOMICAL CHANGES BETWEEN THE BRONZE AGE AND IRON AGE IN THE ALPINE REGION

Author(s): Saliari, Konstantina (Naturhistorisches Museum Wien) - Trixl, Simon (Institut für Paläoanatomie und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München)

Presentation Format: Oral

Archaeozoological assemblages from the broader alpine region evidence remarkable changes in animal husbandry from the Bronze Age to the Iron Age. Although cattle was economically the most important domesticated species in several Bronze Age sites, pigs are found at relatively high percentages and in some cases they even prevail (e.g. mining sites). In contrast, Iron Age bone assemblages indicate the clear dominance of cattle and in some cases of sheep/goat.

Current research explains these changes with the adaptation to general modifications in the socio-economic organisation of the Iron Age alpine population: Between the 6th and 1st century BCE the latter was affected by processes of massive cultural change: With the Fritzens-Sanzeno Culture emerging in today's Tyrol and Trentino, a growing cultural impact of circumalpine Celtic societies and the expansion of Roman influence into the southern Alps, the mountainous region became both: cultural "melting pot" as well as connecting link between Central Europe and the Mediterranean world.

The present study investigates the effect of this development on animal husbandry based on faunal assemblages from the broader alpine region. In this regard, aspects of palaeoeconomy will be considered, based on faunal composition, reconstruction of age and sex profiles and morphometric observations. Finally, the archaeozoological results will be combined with environmental studies and archaeological finds in order to examine processes that could have influenced these changes.

6 MORE THAN SIZE: DOES SHAPE CONTRIBUTE TO MORPHOLOGICAL VARIATION BETWEEN CRANIA OF AUROCHS (BOS PRIMIGENIUS) AND DOMESTIC CATTLE (BOS TAURUS)?

Author(s): Chipping, Ewan - Cox, Philip (The University of York)

Presentation Format: Oral

Since the aurochs (*Bos primigenius*) was domesticated into cattle (*Bos taurus*) they have been intrinsically intertwined with human agriculture. However, with successive transitions in husbandry practices from prehistory to the present it seems the extent to which these two species differ from one another is unclear with the diversity of cattle ever increasing. This study is the first to use geometric morphometric methods to quantify cranial morphology in aurochs and cows to evaluate shape variation between them and to determine the degree to which this is an effect of size change. Crania dating from the Palaeolithic to present, over 190 British specimens, were modelled with photogrammetry to create 3D digital surfaces. The temporal diversity is intended to assess how wild and domestic morphology is changing in line with husbandry practices. To measure this three landmark sets of different sizes were then recorded to enable use of fragmentary remains. In shape only analyses, cows were discretely separated from aurochs, with aurochs crania being relatively longer and more narrow than those of domesticates. However, when adding size, it was apparent this played a major role, contributing a large proportion of the total variance. Notably, the isolated population of Chillingham cattle were found to be morphologically distinct from both aurochs and other domesticates. Much of the variation was observed to occur in the posterior part of the cranium around the horns, which may be due to the anatomical architecture required to support the large horns seen in aurochs. Selective breeding for increasingly docility via a reduction in horn and body size may therefore be the most significant trait of human cattle husbandry. The morphological distinctiveness of Chillingham cattle, which have been unmanaged by humans for over 400 years, indicates the fast rate at which anatomical variation can occur in small and isolated populations.

7 FOSSIL INSECTS, FARMING AND INDICATORS OF CHANGE

Author(s): PanagiotaKopulu, Eva (School of GeoSciences, University of Edinburgh)

Presentation Format: Oral

An overview of insect assemblages from different periods, from the Mesolithic onwards provides an understanding of the changes with the introduction of agriculture and intensification on the landscape. Modified environments evidence changes in biogeography, the origins of culture steppe and also of ecological imperialism in Europe. The Neolithic sees major changes in the faunas of northern Europe with evidence for landscape clearance and modification which extends to the Bronze and Iron age. Invasive species, primarily pests and ectoparasites from the Neolithic onwards, provide an understanding of the movement of farming groups as they hitch a hike from one area to the other. These often depend on man made environments, which include storage, for their survival and establishment and some may play a role in the transmission of infectious diseases which form part of the package associated with mobility of human groups. Specific trends in the faunas associated with particular periods are indicative of human impact as a result of farming or pastoralism. From the Roman period, with the accidental movement of species with the Roman army into new parts of the empire, the assemblages become more strongly synanthropic, as a culture steppe develops. These changes are reflected in both rural and urban areas. From the medieval period onwards there is a geographic expansion of introductions and a subsequent expansion of the spread of disease and biotic exchange and subsequently a loss of biogeographic barriers. This pattern which starts in the Roman period continues up into the 19th century, where a transition begins to more homogenised industrially farmed environments.

8 CHANGING FOOD ECONOMIES IN LATE ROMAN AND EARLY ANGLO-SAXON BRITAIN: THE EVIDENCE FROM CATTLE, SHEEP AND PIG HUSBANDRY

Author(s): Rizzetto, Mauro (University of Sheffield)

Presentation Format: Oral

The fall of the Roman Empire implied major political, socio-cultural, and economic changes in the former provinces and beyond. In Roman Britain, intensive agricultural and animal husbandry practices allowed the production of a surplus which, either through the markets or by direct supply, sustained the taxation cycle imposed by the Empire. The demise of such system bore important consequences in the exploitation of domesticates; their material remains – animal bones and teeth – are therefore very well-placed to inform on the changing nature of food economies in post-Roman Britain.

This paper focusses on changes in cattle, sheep and pig husbandry during the Late Roman-Early Anglo-Saxon transition in central-eastern Britain. In particular, biometrical analyses are employed to assess any change in the sizes of these three species, all of which had been improved in Roman times. In Britain, the Roman animal economy mainly relied on cattle, which was intensively exploited in agricultural activities and butchered for large-scale meat production. The results reveal a size reduction for cattle during the Early Anglo-Saxon period; this is interpreted in light of the different, minor role played by cattle in post-Roman Britain. In Early Anglo-Saxon animal husbandry, sheep was often more important than cattle; biometrical analyses indicate that sheep size remains similar to that of Roman samples. Changes in the use of domesticates are also revealed by culling strategies, that suggest a more generalised exploitation for the Early Anglo-Saxon period. These elements, as well as the complementary use of other domestic species, such as pig, suggest that Early Anglo-Saxon communities had the skills and resources to actively adapt to the new political and socio-economic conditions of post-Roman north-west Europe.

9 ISOTOPIC APPROACHES FOR THE LAND USE AND AGRICULTURE STUDY AT THE WEST VALDAI (NORTHERN RUSSIA) IN THE MIDDLE AGES

Author(s): Dobrovolskaya, Maria (Institute of Archaeology Russian Academy of Sciences) - Tiunov, Alexey - Savinetsky, Arkady - Krylovich, Olga - Kuzmicheva, Evgeniya (A.N. Severtsov Institute of Ecology and Evolution Russian Academy of Sciences) - Svirkina, Natalia - Smirnov, Alexey (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The study of the forms of land use, agriculture relationship with social and cultural changes in the Middle Ages seems to be very important and actual, for certain regions especially. West Valdai region is the territory of the divide between the Volga, West Dvina and the rivers of the North Baltic flow (Pola, Volkhov). This area was covered by dense forest in the Middle Ages according historical sources. On the other hand, there are numerous archaeological sites that testify active using of this area. This territory is characterized by glacial moraine landscape. Numerous burial mounds situated on the tops of postglacial hills, on the high banks of rivers and lakes indicates these elements of the relief as freed from the forest. These and other contradictions prompted us to investigate the isotopic composition of carbon, nitrogen, and strontium of modern flora and fauna in the context of landscape patterns. Based on the analysis of 150 plant samples, 57 fish and 113 mammalian samples, it was shown the patterns of carbon and nitrogen isotopic composition of bone collagen of animals - representatives of the ecosystems "dense forest", "forest open spaces", "river", "lake", etc. These data are used as a basis for studying the medieval local ecosystems, the role of agriculture influence to their transformation. The isotopic composition of carbon, nitrogen and strontium of Medieval inhabitants' skeletal tissues of the region allow to discuss the characteristics of Medieval anthropogenic ecosystems and paleodiets. The study supported by Russian Foundation for Basic Research #17-06-00543.

- 10 EARLY MEDIEVAL DOMBURG, AN ARCHAEOZOOLOGICAL APPROACH OF A CAROLINGIAN TRADING SITE**
Author(s): Pil, Nathalie (Early Medieval Trade in the North Sea Area)
Presentation Format: Oral
- In early medieval times, a few settlements along the North Sea and Baltic regions show a development from small fishermen settlements to a more complex community of inhabitants who are not only involved in fishing, but in other activities as well. Information related to these coastal sites are crucial to delineate their local specificities and common features, which subsequently gives the opportunity to find differences or similarities with more rural and urban settlements. The results of the zooarchaeological study of Domburg reveal an exciting look inside this coastal community, also known as Walcheren. The statistical data of livestock assemblages shows similarities to the other complex North Sea communities. However, the report also indicates some differences in the treatment of animal bones. Cutting marks, specific choices of bone as raw materials and the presence of birds of prey, figure as relics of their daily activities. Through typological and microwear analyses, artefacts as combs, flutes and pins display their connection to the broader trade network of the North Sea basin. The results of this research therefore reinforce the assumption that Domburg was part of the network of complex trading sites along the North Sea.
- 11 ANCIENT DNA AND OSTEOLOGY OF CATTLE FROM IRON AGE TO MEDIEVAL TIMES IN NW SWITZERLAND**
Author(s): Schlumbaum, Angela - Granado, José - Deschler-Erb, Sabine - Stopp, Barbara - Schibler, Jörg (University of Basel)
Presentation Format: Oral
- Phenotypic changes in domestic animals, often indicate changes in the nature of animal husbandry, such as the introduction of new individuals into a population. A classic example of this is the widespread increase in the size of cattle at the transition from the Iron Age to the Roman period, and the subsequent decrease from the Roman to Medieval period. This pattern can be seen at Swiss sites, as well as across many other European areas.
- We monitored ancient mitochondrial d-loop diversity in cattle from Swiss assemblages from the Iron Age (Basel Gasfabrik, Basel Martinsgasse), Roman (Augst/Kaiseraugst: Theater Nord-Westecke, Hotel Adler, Kastelen, Insula 23) and Medieval (Reinach Brunngasse, Lausen) periods. Cattle belong to the taurine macro-haplogroup T3, two Roman cattle individuals belong to haplogroup T2 and one Medieval cattle to haplogroup T1, the later has a mainly African distribution today. We find that genetic diversity correlates roughly with size fluctuations. We will discuss the evidence within its archaeological/archaeozoological context.
- 12 CULTURAL INFLUENCES ON THE CASTRATION TIME OF CATTLE IN THE BALTIC SEA REGION DURING MEDIEVAL AND EARLY MODERN PERIODS**
Author(s): Rannamäe, Eve (BioArCh, Department of Archaeology, University of York; Department of Archaeology, Institute of History and Archaeology, University of Tartu) - Bläuer, Auli (Production Systems, Natural Resources Institute Finland) - Solala, Hilja (History, Faculty of Social Sciences, Tampere University)
Presentation Format: Oral
- Oxen – the castrated male cattle (*Bos taurus*) – have been used in Finland and Estonia as draught animals over centuries. For the earlier periods, the presence of oxen is reflected in the faunal material with proportional differences in bones (especially in metacarpals and horn cores) and pathological changes (caused by traction). Later use of oxen is additionally elucidated by historical documents, listing the number of animals in households and areas. Both evidence tells us about the past agriculture, which was determined by cultural influences, differences in welfare, and environmental conditions.
- Cattle castration has previously been examined mostly through metrical analyses of metacarpals, where cow, bull and oxen bones exhibit different proportions – but only if the males have been castrated as young calves (a method that according to ethnographical sources has been used in Sweden). However, if the males have been castrated as adults (a method that has been used in Estonia), metacarpals will resemble that of a bull. In Finland, a disagreement has occurred between the osteological and written evidence: early modern documents indicate that cattle were castrated as calves (Swedish influence), but bone samples from the Middle Ages exhibit the castration in adulthood (Estonian influence).
- To better understand cultural transitions in the agricultural practices relating to draught oxen, we studied the morphometric changes in a comprehensive assemblage of metacarpals from Finland and Estonia, from the medieval and early modern periods. To validate some of those results, ancient DNA was used to identify the sex of the specimen. Furthermore, historical sources and available literature from Finland and Estonia were examined and compared to the zooarchaeological results.
- 13 THE ARCHAEOLOGY OF ANIMAL HUSBANDRY IN TRANSITIONS: FROM ROMAN TO MEDIEVAL AND FROM MEDIEVAL TO MODERN**
Author(s): Grau-Sologestoa, Idoia (University of Basel)
Presentation Format: Oral
- The application of archaeological sciences to the investigation of agricultural changes in historical times is still a relatively new approach. In particular, projects aimed at researching changes in animal husbandry during the Post-Roman period have become more common only recently, often using one line of evidence (i.e. zooarchaeological evidence) or, less often, combining different types of evidence (i.e. archaeological and historical sources).

In this presentation, we will reflect on the potential and limitations of the zooarchaeological discipline (in combination with other evidence, for instance historical sources and isotopic analysis) to explore topics such as agricultural improvement, productivity, specialized economy and subsistence economy, based on the personal experience of having researched two major transitions in human history: from Roman to Medieval times, and from Medieval to Modern times. In order to do so, two different research projects will be briefly presented and discussed. One of them was developed between 2015 and 2017, aimed at understanding changes in animal husbandry between the Late Middle Ages and the Early Modern period in Spain and in England. The other project, called ZooRoMed, is now in its beginning, and will investigate changes in animal husbandry between Late Roman times and the Early Middle Ages in the Rhine Valley.

14 **FARMING BETWEEN THE CROSS AND THE CRESCENT. ARCHAEOLOGICAL INSIGHTS INTO THE AGRICULTURAL TRANSITIONS DURING THE MIDDLE AGES IN IBERIA**

Author(s): Garcia, Marcos (University of York; University of Granada) - Garcia-Contreras, Guillermo (University of Granada) - Banerjee, Rowena (University of Reading) - Alexander, Michelle (University of York) - Morandi, Lionello (University of Tübingen) - Pluskowski, Aleksander (University of Reading)

Presentation Format: Oral

The impact of the medieval Arab expansion during the 7th and 8th centuries on agriculture –a process famously coined as the ‘Arab Green Revolution’ by Watson in 1974– implied the introduction and/or diffusion of new forms of agriculture that transformed the local economies across the Middle East, North Africa, Iberia and several of the Mediterranean islands. Furthermore, the subsequent conquest of these Islamic societies by Christian forces saw the adoption of these innovative agricultural systems and technologies, alongside the incorporation of conquered Muslim populations.

The aim of this paper is to show how the increasing importance of the role played by archaeological techniques such as bioarchaeology (archaeobotany, zooarchaeology, biomolecular analysis), geoarchaeology and landscape archaeology has contributed to our understanding of agricultural transitions during this period, focusing on socioeconomic, cultural and political dynamics. This presentation is mainly concerned with Iberia as this area has seen a remarkable increase in new archaeological evidence that has emerged during the last few years and is also focus of novel multidisciplinary research projects that aim to examine the ecological impact of Islamic and subsequent Christian regimes across the Iberian mainland and Balearic Islands.

15 **TRANSITION FROM ZEA MAYS TO TRITICUM IN NORTH AMERICA: THE ROLE OF SPANISH MISSIONARIES**

Author(s): Scott Cummings, Linda (PaleoResearch Institute)

Presentation Format: Oral

Colonization of Central and North America required Spanish missionaries to not only build missions, but also grow wheat necessary for the bread of the Eucharist. Historical documents for California missions contain no mention of threshing sledge use, but since threshing sledges were commonly used in Spain and other countries bounding the Mediterranean, it is likely that the technology was imported by missionaries seeking to build missions to convert inhabitants of the New World. The existing record for threshing sledge use in the Mediterranean region extends back at least 8,000 years and can be found in the archaeological record via a combination of the lithic technology and phytolith evidence. In the New World, threshing floors are evident at several missions, but there is a lack of direct evidence for threshing sledges. Seeking to document the transfer of threshing sledges by Spanish missionaries, I first looked at adobe from a mission in California, where I recovered cut phytoliths. Adobe from the walls of a Spanish mission in New Mexico also yielded evidence of cutting, both as phytoliths and also on straws with cut marks retrieved from the adobe. Recovery of cut phytoliths indicates the success in transferring threshing technology to a new population. While typical Mediterranean evidence for threshing indicates chopping straw into extremely tiny pieces for later use as animal fodder and in mud brick, evidence from the New World varies indicating very fine chopping in California to very coarse chopping in New Mexico. This difference addresses the successes and challenges of transitioning from well known Zea mays (maize) cultivation and processing to Triticum (wheat) cultivation and processing. Maintaining standards appears to have been more difficult in New Mexico, suggesting other challenges in a transition not only from Zea mays to Triticum, but also socially.

16 **FEEDING URBANISM: TRANSITIONS TO WET RICE AGRICULTURE IN SOUTH ASIA**

Author(s): Nayak, Ayushi (Max Planck Institute for the Science of Human History) - Fuller, Dorian (University College London) - Boivin, Nicole (Max Planck Institute for the Science of Human History) - Bogaard, Amy (University of Oxford) - Roberts, Patrick (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

Today over 120 million hectares are devoted to rice agriculture in South Asia. This major crop is cultivated in diverse strategies, ranging from low yield and low investment dry rice, to the intensively managed, high yielding irrigated paddyfields, with differing implications for greenhouse gas emissions such as methane and nitrous oxide. It is a staple grain with great ecological, cultural, and nutritional value. However, the different growing ecologies demand very different levels of input and knowledge, thereby having profound implications for social organisation and agricultural strategy. Archaeologically, we begin to see a transition to wet rice agriculture in South Asia from c. 1000 BC from charred crop and weed remains. However, issues of preservation and recovery of crop weed remains persist, and a majority of excavations in the region do not employ adequate flotation techniques.

Here we present evidence for the direct stable isotope analysis of the archaeological grain itself to glean information about growing ecologies, including strategies of manuring and water management. We apply the method to archaeological remains to sites in South Asia spanning time periods of increasing urbanisation, from the 2nd millennium BCE to the 5th century CE. Our data demonstrate the potential of stable isotope analysis of the grain to elucidate major transitions in crop management, social organisation, and environmental conditions within the varied ecological landscape of South Asia.

17 PLOUGHS, PLANTS AND POPULATION GROWTH: PRELIMINARY RESULTS FROM INTER-DISCIPLINARY COLLABORATION INTO THE INCREASE IN ENGLISH AGRICULTURAL OUTPUT BETWEEN AD 650-1300

Author(s): Holmes, Matilda (University of Leicester) - Bogaard, Amy - Forster, Emily - Hamerow, Helena - McKerracher, Mark - Neil, Samantha - Ramsay, Christopher - Stroud, Elizabeth (University of Oxford) - Thomas, Richard (University of Leicester)

Presentation Format: Oral

A dramatic increase in the population of England occurred between the Saxon and medieval periods, alongside economic growth, an increase in urban living and widening social hierarchies. This transition required an expansion of cereal cultivation that culminated in the widespread application of open field farming to facilitate the production of enough food to sustain the increasing population. The Feeding Anglo-Saxon England (FeedSax) project combines analysis from animal bones, seeds, pollen, isotopes and radiocarbon dating to inform the nature of this transition. Did it come about as a wholesale 'package' of social and agricultural change, or was it a case of piecemeal technological uptake as the local conditions necessitated?

As the second year of the project approaches, preliminary results are emerging, as well as a better idea of how the various strands of research will come together. This presentation aims to provide some early data regarding animal husbandry, cereal cultivation, geographical variation in settlement archaeology, agriculture and land use.

One of the strengths of the project is the co-operation of researchers from related but varied disciplines. This is an increasingly common approach as the benefits of cross-discipline enquiry are realised. An overview of the nature of the relationship between these specialists and how the integration of data works within the project will also be presented to provoke a conversation about the ways that it has been implemented on similar projects, and how it can be improved or facilitated better in the future.

A. THAT IS NEW, WHAT IS IT CALLED? COLLAR?

Author(s): Bauer, Anna (Independent researcher)

Presentation Format: Poster

One of the big transitions in agriculture was the invention of the collar. A horse is not really build for a yoke like a cattle but they were also put to the twin yoke, recognizable by its big cavities for clasping the ribs of the horse. The Cattle yokes either rest on the neck, on the forehead or in the front of the withers, for this reason cattle yokes have not big cavities. All types of twin-yokes have been known since the Neolithic and each design has its pros and cons. The only single cattle yoke known until now comes from Pforzheim (Roman-Period) and is a single yoke for the withers.

The only known single horse yokes (roman-time) occur in the shape of an iron bow, which rested on upper side of the neck. Its counter piece could have been a well padded semi-collar or a breast girth. With the collar the horse power is used more efficient because the draught power of the horse is in the upper part of the shoulder exactly where the collar is pressed to the horse shoulder. The horse is faster then a catttle and with a good fitting collar more work can be done.

The speed and carrying capacity of the animals are different and in some cases remarkable. The efficiency of animals always depends on their health condition.

B. PIG AND LIVING SPACE: A COMPARATIVE STUDY OF LATRINE USE IN EAST ASIA

Author(s): Kim, Geon Young (Seoul National University)

Presentation Format: Poster

Pottery made latrines that consist of a human latrine on the upper floor and a pigsty below are one of the most common funeral objects found in East China since the late 2nd century before the common era. Some contemporary dwelling sites also reveal a division of living space during the Han and later dynastic periods, suggesting a possible use of human and domesticated animal(s) faeces as fertilizer. Compared with its neighbour where the living space planning was relevant to the reuse of human wastes for agricultural purpose, not until the late dynastic period did the Korean peninsula show waste management space in a dwelling that is related to animal husbandry and agricultural use. Considering the distinct aspect of animal husbandry in the Korean peninsula, based on artefacts that reveal domestic living space management, historical records including agricultural books, along with human/ fauna remains and soil analysis, this poster discusses the possible relation between living space division modification and changes in cattle husbandry and agricultural practice.

C. THE TRANSITION TO DOMESTICATION IN THE LOWER VOLGA REGION: MULTIDISCIPLINARY APPROACH

Author(s): Vybornov, Alexander (Samara State University of Social Sciences and Education) - Kulkova, Marianna (Herzen State Pedagogical University of Russia) - Doga, Natalia (Samara State University of Social Sciences and Education)

Presentation Format: Poster

Several stratified archaeological sites in the Lower Povolzhye region were studied by multidisciplinary methods in 2014 to 2018.

The materials of archaeological cultures dated to 6200-5300 cal BC contained the bones of wild animals. Nevertheless upper cultural layers on these sites comprised the bones of wild animals together with domestic sheep bones. The lipid analysis of food crusts from pottery supported the presence of milk products. According to radiocarbon analysis the transition to domestication can be dated about 5200 cal BC. The paleoclimatic indicators mark this time as wet conditions of climatic maximum of Holocene which set in after the strong climatic aridization. In this period in forest steppe zone according to pollen analysis a motley grass, cereals, Chenopodiaceae were spread. On the data of phytolith analysis the traces of domestication inside of settlement did not registered. Technical analysis of pottery showed the combination of local and alien traditions of ceramic technology. This can be traced in changes of vessel shapes, manner of ornamentation and compositions. The sharp changes in using of different raw sources can be observed on the stone tools: flint was changed on quartzite. Technology of stone tools was changed drastically with appearance of reinforced stone technique. The big scrapers, knives, points, arrows had a new shapes and were made from massive wide spall. This is evidences of a crisis of the local culture with appropriating economy during a strong climatic aridization and the transition to another type of economy. We suggest the transition to domestication in the Lower Povolzhje region connects with appearance of carriers of new culture from the Lower Don territory. Probably the migration was triggered by drastic climatic changes from region of worse climatic conditions to region of better environment. The first outcomes of transition to domestication for local aborigines are not significant.

173 ARCHAEOLOGY OF MOUNTAINOUS LANDSCAPES IN BALKAN PREHISTORY

Theme: Archaeology of mountainous landscapes

Organisers: Gori, Maja (Ruhr University of Bochum) - Hellmuth Kramberger, Anja (Universalmuseum Joanneum) - Krapf, Tobias (Swiss School of Archaeology in Greece) - Recchia, Giulia (University of Foggia)

Format: Regular session

Ascribed to the peninsula by the German geographer Zeune in 1808, the term Balkan – a chain of wooded mountains in Turkish – describes the region’s main geographic features. Balkan landscape is indeed characterised by mountain ranges intersected by small plateaus and deep river valleys that give way to narrow plains near the sea. Throughout Balkan prehistory mountains alternately represented borders and zones of contact, whereas the river system played a major role as communication route, connecting inland areas to both the Mediterranean and the Black Sea.

Specifically focussing on the Balkan Peninsula, this session aims at understanding different aspects of the interplay between human groups and the mountainous landscape and its change over time.

One of the main goals is to stimulate a theoretical informed debate based on archaeological evidence by cutting across traditional geographic, methodological, and chronological boundaries and by challenging established assumptions and interpretative frameworks. In particular, the following topics will be discussed:

- Appropriation of resources in a mountainous environment. These are intended as socially produced constructions expressing what people perceived as relevant for their life, and satisfying both physical and social needs.
- Building local and “global” identities, change and endurance of cultural customs and socio-political relations
- Mountains as sacred topography. Perception and reshaping of natural landscapes in connection with cult practices and funerary customs.

We invite doctoral students, early career researchers, and established scholars to submit papers discussing their research in Balkan Prehistory. Papers adopting a comparative or diachronic perspective stressing both on local characteristics and interregionally shared features are especially welcome.

ABSTRACTS

1 PROBLEMS AND PERSPECTIVES IN THE STUDY OF BALKAN PREHISTORY

Author(s): Govedarica, Blagoje (Prehistory)

Presentation Format: Oral

As much as it is today, in prehistory the Balkan region was the main route of communication between the cultures of the Near East and those of Central Europe. Moreover, given its location at the intersection of these two large and diverse worlds, this region itself often acted as a source of major cultural advances and innovations. However, research on the prehistory of this part of Europe has not been carried out in a way that corresponds to the culture-historical significance of the region. There are multiple reasons for this, of both general and fundamental character. Namely, it is evident that the study of prehistory, even today still suffers from teething troubles caused by its initial antiquarianism, as well as by its over-dependence on coincidence and other exogenous factors.

No other discipline is determined by external issues to such a degree as is archaeology. Let it suffice to mention the fact that very important archaeological finds are usually not discovered by archaeologists, but by amateurs and farmers in fields. Further, the direction of archaeological investigations is generally not defined by scientific reason, but by cultural, political and economic interests, including tourism and construction activity. Hence, one consequence is the lack of systematic research strategy. This inevitably leads to a poorly argued scientific synthesis, which has to be corrected every few years, or completely rejected.

Such problems burden archaeological practice in all parts of Europe, yet the discipline has still not developed a comprehensive strategy for the systematic resolution of these issues. Due to a combination of different circumstances, all of these problems are particularly prominent in the study of prehistory of the Balkans, and this will become apparent from the several examples presented in the paper.

2 IN THE GORGES OF THE BALKANS: THE ARCHAEOLOGY OF MOUNTAINOUS LANDSCAPES

Author(s): Ivanova, Maria (University of Heidelberg)

Presentation Format: Oral

Middle- and high-altitude landscapes are often viewed as marginal areas in Balkan archaeology. Excavations in many parts of the peninsula have traditionally concentrated on the larger and well-stratified sites in the lowlands, and the intensity of fieldwork is still significantly higher in the valleys and plains. Yet mountainous landscapes are a dominant feature in the geography of the Balkan Peninsula, and research in other parts of Europe has shown how an “upland” outlook can significantly advance our understanding of local and supra-regional developments. In this contribution, I briefly summarise previous research on the prehistory of middle- and high-altitude landscapes in the Balkans. I also present several examples of interdisciplinary approaches to the archaeology of upland and mountainous areas in other parts of Mediterranean and Alpine Europe, to illustrate the potential of upland sites as a subject of field- and laboratory-based archaeological research. These examples deal with questions such as agro-pastoral pressure on mountain palaeoenvironments, woodland management, complementarity of highland and lowland settlement systems, recognition of past mobile pastoral economies, high mountain agriculture, and sedentary vs mobile settlement forms. They combine methodologies of archaeology and the archaeological sciences, including ethnoarchaeology, isotope analysis, and palaeoenvironmental studies.

3 LIFE IN THE FOOTHILLS: A DIACHRONIC ASSESSMENT OF NEOLITHIC SETTLEMENT PATTERNS IN THE SANDANSKI-PETRICH BASIN OF SOUTHWEST BULGARIA

Author(s): Whitford, Brent (SUNY Buffalo)

Presentation Format: Oral

The Sandanski-Petrich Basin is situated between the Serbo-Macedonian and Rila-Rhodope Massifs in the Middle Struma River Valley of Southwest Bulgaria. Settled during the Early Neolithic Period by approximately 6200 cal BC, the occupation of Sandanski-Petrich represents one of the first instances in which early agricultural practices were transferred from the North Aegean towards the more temperate environmental conditions of the interior Balkan Peninsula. To date, a comprehensive series of archaeological surveys have identified six Early Neolithic, eighteen Middle Neolithic, and seventeen Late Neolithic settlements. Notably, the earliest settlements are all geographically confined to the foothills of the Pirin and Ograzhden Mountains, whereas valley bottom settlements do not appear until comparatively later during the Late Neolithic Period. The latter therefore stands in stark contrast to the oft-cited hypothesis that the neolithization process of Southeast Europe was primarily driven by a leap-frog distribution of early agricultural settlements in the fertile valley floodplains of the major river systems (Davison et al. 2006; Gimbutas 1991; Sherratt 1980). In this paper I argue to the contrary that the geography and climate of the Sandanski-Petrich Basin was more conducive to the establishment of small-scale farming villages in the foothills and that such settlements would have been primarily reliant on rainfed agriculture and animal husbandry for their subsistence. Furthermore, I demonstrate how these uniquely regional characteristics contributed to the emergence of a localized identity in the Sandanski-Petrich Basin that lasted all throughout the Neolithic Period. In conclusion, I emphasize that the archaeology of mountainous landscapes is far more important with regards to the neolithization process of Southeast Europe than has to date been recognized.

4 PROSPECTING FOR PREHISTORIC COPPER – FIELD OBSERVATIONS FROM A GEOARCHAEOLOGICAL SURVEY IN SE BULGARIA

Author(s): Kunze, Rene (Martin-Luther-University Halle-Wittenberg)

Presentation Format: Oral

The primary and secondary copper deposits of the Medni Rid highland in south eastern Bulgaria close to Burgas have been mined extensively over the last centuries. LiDAR data has been used to identify targets for ground thruthing of geoarchaeological and montane archeological interest as well as archeological settlement remains. The localization of prehistoric mines has been aggravated due to intense reworking and overprinting by mining activities from the antique to communist times. Up to now, over 80 findspots – including ore deposits, traces of partially fortified settlements, burial mounds and metallurgical smelting spots – have been found and documented.

During a rescue excavation led by P. Leshtakov (Sofia), amongst others remains of ore, crucibles and slagged pottery were found in Chalcolithic layers of the excavated settlement Akladi Cheiri between Chernomorets and Sozopol. These finds indicate an early metallurgical use of copper during the 5th millennium BCE. The evidence of metallurgical ability shows, at least indirectly, an easily recognizable chain of metallurgical activity, beginning with ore extraction through to the production of the artifacts themselves.

It seems that the raw material deposits Medni Rid are the first that were exploited for green minerals and even for copper production from the transition from the 6th to the 5th millennium BCE. Neighbouring settlements such as Akladi Cheiri, Budzhaka and Alepu as well as Hadzhidimitrovo and Dana Bunar 2 used the easily accessible copper ores, which must have been exposed to the

surface. Due to the rather low copper contents in most pieces of ore only a small amount of metallic copper could be smelted. Nevertheless, it must have been more than for domestic use, because this copper with a characteristic geochemical fingerprint reached Durankulak in northeast Bulgaria and Dăržanica near the Iron Gates of the Danube.

5 BETWEEN TRADITION, INNOVATION AND INTERACTION: EARLY COPPER AGE IN THE SOUTH-EASTERN PREALPS AND IN THE WESTERN PANNONIAN BASIN

Author(s): Kramberger, Bine (Institute for the protection of cultural heritage of Slovenia)

Presentation Format: Oral

One of the main characteristics of the Copper Age in the south-eastern Europe is the collapse of the larger settlements (tells) that were settled over longer period and the appearance of small short-lived settlements. The causes of these changes are probably of economic and social reasons, and they have occurred most likely due to changes in living conditions (the appearance of a more dry climate), and technological innovations (e.g. Bánffy 1995, 183-187; Bánffy 2010). In the studying area, north-eastern Slovenia, however, there is very little known about the prior Neolithic settlement system, because a larger amount of settlements appear for the first time in the following period, in the second half of the 5th millennium BC. These settlements belong to the Lasinja culture, which was distributed at the beginning of the Copper Age in Austria, western Hungary, through northern Croatia and Bosnia, and coincides with the similar and related cultures distributed at the central Balkans (Krivodol-Sălcuța-Bubanj-Hum1 complex). The topic of this paper is the evaluation of the background of the aforementioned changes in the second half of 5th millennium BC in north-eastern Slovenia, based on analysis of the material culture in the region and beyond by a multi-analytical approach. It has been known for a long time that connections with the central Balkan region have played an important role in the formation of a new cultural groups in the south-eastern Alps and in Western Pannonia at the beginning of the Copper Age (Bánffy 1994; 1996; 2002). However, new systematic analysis gave us further data for a better understanding of these connections.

6 WESTERN BALKAN MOUNTAINSCAPES: CONNECTIVENESS AND DISCONNECTEDNESS IN THE CETINA PERIOD (2500-2000 BC)

Author(s): Recchia, Giulia (Sapienza University of Rome) - Gori, Maja (Ruhr University Bochum)

Presentation Format: Oral

The Cetina phenomenon is still being investigated mostly focusing on its Mediterranean dimension. Yet, in its core area Cetina sites are not coastal, rather they flourished inland of the karst environment of central Dalmatia, dominated by the Dinaric Alps ridges interspersed by fertile plains. The actual geographic extension of Cetina core area has yet to be clearly understood. At present, the Velebit massif appears somehow to mark a border (though permeable) towards the north. On the eastern and southern side, however, the Bosnian and Montenegro ridges do not seem to have constituted obstacles for social interactions and shared cultural traits.

The main source of information on Cetina culture in Dalmatia is still the distinct pottery coming from funerary contexts and caves, while we lack data from settlements and more generally on the socio-economic organisation of these communities. Nonetheless, it is time to start working on socio-economic models and patterns of interactions, also in order to develop a new research agenda.

In this presentation we will suggest possible socio-economic models for Cetina groups and discuss the role of mountainscapes as both economic and cultural resources for these communities. Cetina communities were likely prone to short-range and long-range mobility and they shaped their own landscape through the building of funerary tumuli. The geographic dimension and the changing role of mountains as connecting/ disconnecting elements will be also addressed.

7 WHEN (SOUTH)EAST MEETS (NORTH)WEST. TRANSCULTURATION PHENOMENA IN THE WESTERN BALKANS AT THE END OF THE THIRD MILLENNIUM BC

Author(s): Gori, Maja (Ruhr Universität Bochum)

Presentation Format: Oral

Since recent the end of the third millennium BC in southern Balkans was poorly known as its chronological and cultural definition was largely based on loose pottery typology. The chronology of the Armenochori cultural group, indeed, has always posed somewhat of a problem, and it was considered as an isolated phenomenon in the Balkan and Aegean Bronze Age. Although based on limited evidence, new absolute dating of the Armenochori cultural group suggests that it can be tentatively divided into two partially overlapping phases that span the entire second half of the third mill. calBC (Bulatović, Gori & Vander Linden 2019). In the last quarter of the 3rd millennium calBC an expansion of Armenochori features from central Macedonia towards the north along the upper stream of the South Morava River, the west across the Dinaric Alps, and the south towards the Chalkidiki Peninsula can be assumed. Likewise, advancement in absolute dating and archaeological research on the Dalmatian Cetina phenomenon (Forenbaier 2018; Gori, Recchia & Thomas 2018) suggests a chronology for this group that encompasses the entire second half of the 3rd mill. BC, and a tentatively division into two phases (Recchia & Cazzella 2017). Armenochori and Cetina groups have been always considered as two distinct and detached cultural entities that never interacted. However, by looking at absolute dating combined with data from new and old excavations an interaction between the Cetina and the Armenochori groups can be traced at the end of the 3rd mill. cal BC. Interaction seems to have occurred mainly in the mountainous region connecting Macedonia to Dalmatia, where transculturation between these two groups can be observed in ceramics from both graves and

settlements.

8 MOUNTAINS VERSUS THE VALLEY: LANDSCAPE OF PREHISTORIC TUMULI & HILLFORTS IN THE CETINA RIVER VALLEY (CROATIA)

Author(s): Tomas, Helena - Triplat, Jura (Department of Archaeology, Faculty of Humanities and Social Sciences)

Presentation Format: Oral

During the Early Bronze Age in the hinterland of the East Adriatic coast a culture was born – Cetina Culture – characterised by stone tumuli. Richer tumuli were equipped with burial goods including decorated pottery. This decorated Cetina pottery had a wide distribution: associated groups have been found in Albania and Italy, but also Malta, the Peloponnese and the Saronic Gulf. In brief, Cetina Culture was a phenomenon that by far surpassed its original habitat along the eponymous river.

Stone tumuli are still visible scattered on mountain slopes surrounding the Cetina river valley. Their position gives an impression that they were meant to oversee the valley. No traces of settlements have been found in the immediate vicinity of tumuli, which is not surprising considering that this mountainous landscape is mostly karstic. However, within the valley itself hillforts can be visually spotted, sitting on top of small hills above the river. Fields along the river were occasionally inhabited as well (pile dwelling settlements). The paper discusses the spatial relationship between tumuli and the areas where contemporary settlements would have been. It will be argued that the position of tumuli, somewhat distant and elevated from the settlements, had a symbolic meaning: the dead members of the community were looking over still living ones and protecting them, which in turn gives the overall landscape of the Cetina valley a powerful symbolic message. This interplay between the tumuli and the river with accompanying settlements will be presented through several case studies.

9 ARCHAEOLOGY AND HISTORY OF CROATIAN MOUNTAINS. PROBLEMS, PERSPECTIVES

Author(s): Olujic, Boris (University of Zagreb, Faculty of Humanities and Social Sciences)

Presentation Format: Oral

Mountains in history and archaeology were concerned more as obstacles and barriers than as a spaces of connection and interaction. Last two decades I conducted and participated in numerous research campaigns in Croatian mountains, especially Velebit, Kapela and Biokovo. In this paper I will present the results of previous campaigns but more our dilemmas and questions on prehistory and antiquity of those complex ecosystems. The images of mountains and their inhabitants given by narratives of written sources from Antiquity to Early Modern and Modern age and its confrontation with data of spatial and environmental analysis and studies of material culture also will be a part of this contribution. In June and July we will have in the National Park Northern Velebit a 5th Croatian-American field school (University of Zagreb, University of Wyoming, University East Oregon, Ministry of Culture and Institute of Archaeology in Zagreb). The goal of recent research of our field school is understanding of communication systems, interaction landscape - human society. In this paper we will present recent results of our work.

10 THE UČKA MOUNTAIN RANGE - A GEOGRAPHIC AND CULTURAL BOUNDARY DURING THE DEVELOPED EARLY AND MIDDLE BRONZE AGE?

Author(s): Hellmuth Kramberger, Anja (Universalmuseum Joanneum)

Presentation Format: Oral

In the first half of the second millennium BC, the Istrian peninsula emerges as a coherent cultural space, which is characterized by Gradinas, fortified hilltop settlements with circular walls built in dry-stone technique, and a very specific pottery. The rough karst landscape of the peninsula was inhabited especially in the western part in the coastal areas, the mountainous central and northeastern part show a lower population density. Influences of the Istrian peninsula respectively the integration into the same cultural space are particularly evident in the spread of the specific pottery in the area of the Trieste karst on the one hand and in the area of the Kvarner Bay on the other. In particular, the appearance of comparable material culture on the Kvarner islands speaks for a lively exchange in the context of a communication network by sea. The situation is markedly different in the hinterland of the Primorsko-notranjska region of south-western Slovenia and in the Primorje-Gorski kotar county in north-western Croatia, which are bordering on Istria. Comparable ceramics are hardly known here. The question arises whether this is merely a desideratum of research or whether the Učka massif in the north-east of the Istrian peninsula formed a geographic and cultural boundary during the developed Early and Middle Bronze Age?

11 ANOTHER STONE IN THE WALL... MASSIVE BRONZE AGE DRYSTONE WALL FORTIFICATION AT THE TURANJ GRADINA SITE (NORTHERN DALMATIA, CROATIA)

Author(s): Celhar, Martina (University of Zadar)

Presentation Format: Oral

The Department of Archaeology of the University of Zadar has conducted systematic research of the site of Turanj Gradina since the year 2016, and the main research focus is on a massive drystone wall construction enclosing the site. So far a section of a funnel-shaped entrance corridor with the length of 9 meters has been explored and a 7-m wide wall segment along its eastern side. Massive wall is in contrast with a small usable area of the hillfort of only 1,5 ha and a lack of more distinct cultural layer that supports the hypothesis that this was not a settlement *sensu stricto*. Namely in the large part of the area cultural layer is missing or there is only a thin humus layer with a certain amount of fragmented pottery sherds that can be associated with the Bronze

Age. Therefore the question arises as to what community built this complex and monumental fortification and to what end?

- 12 HIGHER GROUND – CHOICE, CONTROL AND CARE BRONZE AGE HILLTOP SITES IN CENTRAL BOSNIA**
Author(s): Gavranovic, Mario (Institute for Oriental and European Archaeology, Austrian Academy of Sciences) - Bujak, Edin (University of Sarajevo)
Presentation Format: Oral
- The paper will focus on recent investigation of several Late Bronze Age (13th- 9th century BC) hilltop sites in the mountainous area of central Bosnia. Typical for landscape of this region are 2000-meter high mountains of Dinaric Alps and smaller river valleys and basins, building up a perfect scenery for a micro regional research approach within one specific area, determined by the geography and landscape. The area chosen for a detailed study is located in the Basin of Bosna River near city of Zenica. Conspicuous for this micro region are several fortified plateaus on high (700-900 Meter), prominent positions with an ability to oversee most of the lower areas. Additionally, all of the fortified plateaus are in a direct mutual visual contact to each other. While the surface finds indicate that plateaus were permanently occupied, the geophysics, air-borne scanning and excavations conducted in 2018 und 2019 seek to reveal the real nature and background of these extraordinary sites.
- 13 THE BRONZE AND IRON AGE OCCUPATION OF THE BLAZI, NEZIRI AND KĚPUTA CAVES IN THE MATI REGION OF NORTHERN ALBANIA**
Author(s): Krapf, Tobias (Swiss School of Archaeology in Greece) - Gjipali, Ilir (Institute of Archaeology, Tirana) - Gori, Maja (Ruhr University of Bochum) - Ruka, Rudenc (Institute of Archaeology, Tirana) - Hauck, Thomas (University of Cologne)
Presentation Format: Oral
- In the region of present Albania, different ecosystems were inhabited at the same time throughout prehistory. Indeed, it is not rare to find wetland settlements, fortified hilltops and caves dwelled contemporaneously even within one bounded area like the Korça Basin in the Southeast of the country. Recently, a complex of three well-known caves (Këputa, Blazi and Neziri) located in the Mati district of Northern Albania, at ca. 300 masl, was made object of new excavation by the German Albanian Paleolithic Programme (GAP). These caves, which occupy a favorable position overlooking the surrounding alluvial plain, shield several meters of archaeological deposits ranging from the Paleolithic period to the Early Iron Age, and represent an important reference stratigraphy.
- The present paper focusses on the Bronze and Iron Age layers and aims at exploring the role of the continuing use of these caves in the later part of prehistory, when open settlements are more commonly attested. Through the study of pottery assemblages, different activities can be observed. The presence of Early Bronze Age Cetina pottery in connection with a peculiar clay handle/figurine (Blazi), and, in the Early Iron Age, of broken turban dish bowls spread on the floor of the Këputa cave suggest the presence of ritual activities. After the Early Iron Age the caves were only sporadically visited.
- The comparison of the Bronze and Iron Age pottery from these caves in the Mati valley with contemporary assemblages from nearby regions sheds light on possible differences between the varied types of settlements located in diverse ecosystems: wetlands, coastal areas, mountains. In particular, the differences between the North and the South of Albania, which are geographically connected to different networks, will be outlined. Parallel developments in pottery production prove that the apparently difficult landscape characterized by mountain chains never prevented contacts and mutual exchanges.
- 14 CENTRAL BALKANS AND AMBER IMPORT DURING THE BRONZE AGE: ROUTES, DYNAMICS AND ROLES**
Author(s): Cwalinski, Mateusz (Institute of Archaeology, Adam Mickiewicz University of Poznań)
Presentation Format: Oral
- The paper touches upon the issue of amber inflow to the Central Balkans and its circulation between individual regions situated in this zone, during later stages of the Bronze Age (more specifically around 1600-900 BC). In the past several authors have discussed the possibility of Morava – Vardar valleys being used as an amber trade route connecting the Carpathian Basin with the Balkan interior, and further south with the Greek mainland. Nonetheless, most have concluded that there is not enough evidence for a steady use of this trail in such capacity. Furthermore, the inherent features of the Balkan landscape were deemed unfavourable for the movement of goods and people, thus the latter must have been intermittent rather than regular. Growth of data related to this subject in the recent years prompts to reconsider it with application of previously unused methods. Hitherto documented amber finds were classified typologically, and subsequently analyzed in temporal and spatial dimensions, with seriation and correspondence analysis respectively. Observations stemming from these statistics were subsequently used in the network analysis, quantifying similarities between regionally grouped amber finds. The considerations on amber were supplemented with typo-chronological analysis of selected artefacts, co-occurring with amber at find-spots. The results shed a light on internal dynamics of amber circulation, and allow to pin point main recipients and potential exchange participants. Which routes exactly were most likely used by travellers – merchants is up for debate, however it can be concluded that during certain periods in the 2nd mil. BC goods moved meridionally across the Central Balkans, and amber undoubtedly was one of them.

15 SOCIO-ECONOMIC ENTANGLEMENTS OF THE LBA GOLDMINE AT ADA TEPE (BULGARIA)

Author(s): Burkhardt, Laura (Institute for Oriental and European Archaeology)

Presentation Format: Oral

The discovery of the up to now only known gold mine of the European prehistory in the Rhodopes (southeast Bulgaria) opens new perspectives on the old discussions about Aegean-Balkan contacts in the Late Bronze Age. Through the modern excavation of the site (by H. Popov Bulgarian Academy of Science NIAM-BAS), a number of new data are available to reassess the relations between Mediterranean civilizations and their periphery. In order to gain a better understanding of the socio-economic entanglements, a comparative analysis of the local and everyday practices of the gold miners is made in relation to those of adjacent regions. The presentation will focus on selected aspects of the researcher's doctoral thesis, which is dealing with the settlement of the gold miners, and is embedded in the project "Bronze Age Gold Road of the Balkans - Ada Tepe mining" (led by B. Horejs, Austrian Academy of Science OREA Institute, founded by the FWF, project no. P28451). While the previous debates on Aegean-Balkan contacts were mainly based on prestige goods, there is now a rational and economic reason that could explain the connections. It sheds a new light on the complexity and multidimensionality of the Late Bronze Age contact and interaction networks between the Balkans and Greece, which worked simultaneously at different socio-economic levels.

16 IS IT LONELY IN THE MOUNTAINS? PATTERNS OF ISOLATION AND INTERACTION IN LATE BRONZE AGE THRACE

Author(s): Nenova, Denitsa (UCL)

Presentation Format: Oral

In the southeast corner of the Balkan peninsula an assorted set of landscapes, commonly known as Thrace, constitutes of river valleys and vast plains divided by mountain chains. The area has played a connecting role in the prehistoric communications between the Aegean coast and Anatolia on the one hand, and continental Europe, on the other. It seems that this geomorphological segmentation and the particularities of its geopolitical location have influenced the lifestyles and the direction of people's interactions across the region and have naturally encouraged the existence of local as well as interregional routes.

Despite its ecological fragmentation, the area has often been considered and studied as an entity, manifesting a homogeneous unit rather than shifting prehistoric cultural assembly across the landscape. What seems challenging is the dominant idea of a single, sizeable ethnocultural group inhabiting the area throughout the latter part of the 2nd millennium, which is both unlikely and risks ignoring abundant evidence of a local difference. Recent data suggests habitation diversity, both spatially and chronologically defined, which differs significantly in material culture and settlement patterns from contemporary lowland groups and societies. Such distinction, however, cannot be explained merely by 'lowland agricultural' or 'mountain cattle' cultures but embraces more complex cultural dynamics. For example, during the Late Bronze Age the Rhodope Mountains get 'repopulated' after a long chronological hiatus following the end of the fourth millennium BC; even then the Rhodope sub-region reveals a pattern of isolation typical for traditional mountain societies, but also recognizable through nomadic or semi-nomadic arrays and specific religious landscapes rather than sedentary occupation. The mechanisms of such diachronic interaction between higher altitude places and the human choices hidden in the landscape are the topic of the current paper.

17 PREHISTORIC BURIAL MOUNDS – IN THE MOUNTAINOUS LANDSCAPE OF MODERN NORTH MACEDONIA

Author(s): Atanasoska, Nevenka - Chvojka, Ondřej (University of South Bohemia)

Presentation Format: Oral

Macedonia is a country covered predominantly with mountains. During the prehistory, inhabitation regions changed, but mostly inhabited were the valleys. Change is noticed during the Late Bronze Age and the Iron Age when the burial mounds started to be used on the territory of today's North Macedonia. The largest concentration of this type of burial is in higher altitude regions bordering the plains and valleys, such as Mariovo, a mountainous area rising above Pelagonia plain. It represents the most significant Macedonian region in prehistory and even later. Reason for this situation is still unknown for the archaeologists but several points have been made concerning the landscape and social structure of the communities that were using burial mounds.

The primary goal of the paper is to investigate and to present the potential of these hilly and mountainous regions and certain mounds but also to emphasize the importance of incorporating some of the non-destructive methods into further study of the phenomenon. They could contribute to pointing out some other research possibilities contrary to the traditional study of material culture, which has not yet yielded some specific results.

Thus one of the biggest problems that Macedonian archaeologists are currently dealing with is the lack of information about the spatial distribution of these specific types of burials and their connection to the concurrent settlements, but also insufficient financial means, the use of non-destructive methods and analyses (GIS, archaeological remote sensing, statistics and so on) is considered inevitable.

This paper brings the first information about a doctoral project solved at the University of South Bohemia in České Budějovice, Czech Republic.

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GOING GLOBAL, STAYING LOCAL? THE OHRID REGION BETWEEN THE BRONZE AND THE IRON AGES**Author(s):** Vercik, Marek (Charles University, Prague) - Ardjanliev, Pero (Archaeological Museum of Macedonia, Skopje) - Tušlová, Petra (Charles University, Prague)**Presentation Format:** Oral

The city of Ohrid lies on the northern shore of a homonymous lake within the orogenic belt of Dinarides–Albanides. The basin of Lake Ohrid is framed by the Galichica Mountain Range (max. 2,250 masl) to the east and the Mokra Mountain Range (max. 2,200 masl) to the west. Despite the mountainous framing, this basin and range setting provides the broadest accessible link between the Aegean and the Adriatic regions in the southern Balkans – and was, vice versa, an eminent condition for the formation of the supra-regional connection widely known as the “Candavian Road” or, from the Roman period onwards, Via Egnatia. Placed on this communication route, the region around Ohrid represented an important hub in the cultural connectivity between the southern Aegean cultural koine and the Balkans in the north. Even though the exact timing of this line of communication opening remains obscure, the interdependences between the regional habitation and the road(s) have appeared to be intelligible: an explicit local development has been postulated for the Bronze / Early Iron Age in contrary to a global connectivity of the Developed Iron Ages. However, several methodological concerns raise with regard to the differing nature of the given archaeological material from Bronze Age settlements and the necropolises of the Iron Ages. The actual project Frontier Studies tries, hence, to emphasize a diachronic, archaeological and palaeoenvironmental study in the region to get a richer insight into the settlement/cultural dynamics and the establishment of supra-regional connectivity in the region in the face of its mountainous landscape; for the latest offers the possibility to test different theoretical approaches in order to explain the development of the socio-cultural customs in a “closed” region diachronically.

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OF VALLEYS AND MOUNTAINS – EXCHANGE OF GOODS AND IDEAS IN THE VARDAR AND BREGALNICA VALLEYS DURING THE IRON AGE**Author(s):** Heilmann, Daniela (LMU München)**Presentation Format:** Oral

A substantial part of the Macedonian region is comprised by the course of the Vardar/Axios River, which links broad valleys separated from one other by formidable mountain ranges, including the Demir Kapija, also known as the Iron Gate of Macedonia. Demir Kapija marks a climatic and geological barrier that separates the Lower Vardar Valley, characterized by a sub-Mediterranean climate, from the continental sub-Mediterranean climate of the regions situated to the north. During the period of the Early Iron Age, the gorge and the surrounding mountains seem to have had an impact on the differentiation of cultural landscapes, which is reflected in the distinct material culture and ideologies, separating groups from the Lower and Upper Vardar and Bregalnica Valleys. In the past, this differentiation led to the description of various archaeological ‘cultural groups’ within the Macedonian region. The aim of the paper is to re-examine the criteria by which this distinction was once made as well as to evaluate the possible impact that the natural conditions might have had on the cultural landscape by focusing on interactions and underlying processes. One criterion for the regional differentiation relies on pottery styles, which gives precedence to the manufacturing techniques rather than commonality of shapes. However, areas to the north and the south of the Demir Kapija share the ‘jug with a cut neck’, a shape in both a handmade and a wheelmade variant. Thus, by looking at this type of pottery and by discussing the burial customs as well as precious portable goods like the so-called ‘Macedonian bronzes’, this contribution will identify which aspects of the material culture and connected ideologies and beliefs circulated only locally and which aspects linked regions to the north and the south of the mountainous barrier of Demir Kapija.

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ARCHAEOLOGICAL IDENTITY OF FRIULIAN MOUNTAINOUS COMMUNITIES DURING THE EARLY IRON AGE**Author(s):** Simeoni, Giulio - Corazza, Susi (Università degli Studi di Udine)**Presentation Format:** Oral

Friuli Venezia Giulia, in north-eastern Italy, includes an extremely heterogeneous territory, which extends from the Adriatic coasts to the peaks of the Carnic and Julian Alps, northwards and, eastwards, from the easternmost part of the Po Valley, through the Karst plateau and river valleys, to the Danubian basin. Even though about half of the surface of region is occupied by mountains, archaeological evidence in this area is scanty, at least an early part of the protohistory. The systematic research carried out in the last 20 years and several sporadic discoveries, allow us to draw a more articulated picture for the mountain district of Friuli starting only from the Final Bronze Age, a period characterized by the occupation of dominant sites providing a strategic control on riverways. This is particularly clear in the Early Iron Age, when some sites, which will have a long-lasting cycle of occupation well, become important nodes of a network connecting the main centres of Veneto and Friuli with the upper Soča and Gail valleys, which constitute gateways towards regions rich in strategic resources such as metals and salt.

Starting from the advanced 6th century B.C., the mountains of Friuli seem to have reached its maximum development phase for the pre-Roman period, being part of a system of circulation of artefacts that involves the entire central-eastern Alpine area from Veneto to Trentino and Slovenia. In particular, the data from the Early Iron Age funerary contexts –strengthened by some analytical results regarding metallurgy and paleodiet, allow us to put forward some observations on the formation of local identities through the comparison with different mountain and lowland environment.

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Bonacchi, Chiara (University of Stirling) - Hølleland, Herdis (Norwegian Institute for Cultural Heritage Research - NIKU)

Format: Regular session

The ideas of 'risk', 'chance' and 'challenge' all imply a series of value judgements around what we perceive as worth interpreting, preserving, managing and keeping accessible, in the present and for the future. These value judgments can be implicit or markedly explicit, but they lie at the core of the trajectories we co-design and implement for heritage objects, places and practices. Although there is substantial literature on the topic of social, cultural and economic value in archaeology (e.g. Bonacchi 2013; Burtenshaw, 2017; Jones 2017), and arts and culture more generally, a fundamental rift still remains between economic approaches to value and social ones; and between policy-makers' preferences for econometrics and quantitative measurements, and academic critique of these methodologies and the objectifications and reductionism they can entail (O'Brien 2014; Belfiore & Upchurch 2013). In this session, we invite speakers to embrace the challenge of re-thinking ideas of public value in archaeology and heritage, and of reflecting on the ways in which different value theories and methodologies can be drawn upon to practically identify goals and priorities for heritage practice. We welcome papers that address definitions of public value/s in archaeology and heritage, from a social and/or economic point of view, describe how such concepts can be assessed, and how they contribute to a certain vision of future societies. Papers can be either entirely theoretical or draw on case studies from Europe or further afield. One of our aims is, indeed, to bring different visions and value notions into dialogue in order to think of heritage futures in more collaborative and creative ways.

ABSTRACTS

1 PRIORITISING PUBLIC VALUES IN ARCHAEOLOGICAL HERITAGE MANAGEMENT FRAMEWORK

Author(s): Tung, Yu-tz (Institute of Archaeology, University College London)

Presentation Format: Oral

The archaeological site management methods have suggested the significance of understanding and balancing values, i.e. values-based approaches by Getty Conservation Institute and the Australian ICOMOS Burra Charter. The post-processual reflexivity demands archaeologists to the public into not only access the results but also the management processes to demonstrate the resources spent are for public good. The roles of local community are also emphasized in international guidelines as the 5C and sustainable heritage management for cultural diversity, which indicated it is the professionals' responsibility to better understand and integrate public values into management decisions. These approaches aim to establish a link between public and heritage, in addition to have professionals explore the archaeological heritage from public perspectives. The Heritage Lottery Fund has recognised public values as internal, instrumental and institutional, which a sustainable management ought to be a balance of the three aspects. Taiwan, though late in developing its archaeological heritage management framework, has followed the international trends as well as the grassroots groups' outcry for native heritage. Increasing demands to respect public values can be found in the amended legal frameworks and cultural policies besides the long existed professional concerns. It is interesting to investigate the management processes of one of the designated prehistoric sites in Taiwan, Huilai, with values-based approaches. The analyses comprise of the stakeholders and values, decision-making processes, its uses, and anticipations. This case study demonstrates diverse values of different scopes, of economic, use and cultural by authorities, professionals, private developers, local communities or wider people who visit the site. These assessments allow us to observe identity building of the Taiwanese public on the sense of place. Values-based approaches lend a lens for comprehensive assessments of the context, and serve as guidelines to critique the conflicts and provide recommendations effectively elaborating public values, further attain sustainable developments.

2 PUBLIC VALUE OF ARCHAEOLOGICAL LANDSCAPE: A SOCIAL POINT OF VIEW IN BUENAVISTA DEL NORTE (TENERIFE, CANARY ISLANDS, SPAIN)

Author(s): Pérez, Elena (Universidad Europea de Canarias) - Castillo Mena, Alicia (Universidad Complutense Madrid) - Chávez Álvarez, María - García Cruz, Juan (Universidad de La Laguna) - Cruz González, Ana (Escuela Universitaria Turismo Tenerife) - Ferrer Román, Esther (Univesidad Europea Canarias) - García Herrera, Angela (Ayuntamiento Buenavista del Norte) - Stendardi, David (Universidad Europea Canarias)

Presentation Format: Oral

In this paper we present the work that is being carried out within the research project "Society and Archaeological Heritage: recovery of the Archaeological Heritage of Buenavista del Norte (Tenerife, Canary Islands) in rural and urban areas (PARQ_BVISTA)". The general objective of this project is to identify and propose actions to recover the archaeological landscape of rural and urban spaces through public knowledge of archaeological heritage. A research methodology with a strong social and participatory approach is being used. In addition to taking into account the quantitative data and official information on archaeological assets that already exist, this work is exploring factors concerning the urban and rural integration of archaeological heritage as part of a multidisciplinary process of heritage management. In this way we have jointly included and evaluated the contribution of social

perception analysis with the expert knowledge of archaeological landscapes, being the first time that this methodology has been used in the Canary Islands archaeology. These results will serve to turn public perception into objective data that we can contrast with official information and initiate social participatory processes in Buenavista Del Norte.

The resulting model aims to explore the public and social value of archaeological heritage in a broader sense than the traditional and official way which is more individual and isolated, creating and empowering the public value of archaeological landscape in the public policy strategy. The model also aims to integrate cultural heritage as a fundamental piece in the social, economic and political development of this municipality, and ultimately to improve the quality of life of the population.

3 **DIGGING FOR DEMOCRACY: HOW OUR HISTORIC ENVIRONMENT IS HIGHLIGHTING A CRISIS IN THE DEMOCRATIC CONSULTATION PROCESSES**

Author(s): Morel, Hana (UCL, Institute of Archaeology)

Presentation Format: Oral

In October 2019 I organised a conference in London titled 'Engaging with Politics in the UK: Responding to Changes in Planning, Heritage and the Arts', which brought practitioners from a range of sectors and industries together to explore how they are practically responding to the vast changes unfolding within heritage, museums, planning and arts sectors. As a Research Associate in academia, and a Secretary of the civil society pressure group Rescue, I am increasingly concerned with how and whether the average Joe and Jane Doe are represented in the institutions of law and State, and whether this representation is embedded or not into the very forms of the urban fabric and daily experience we live in.

The protections of the historic and natural environment are changing at such rapid pace that at best interested or involved stakeholders are aware of changes to policy, or at worst are alienated from being a part of any decision-making and policy implementation processes. In-depth interviews conducted in 2013/14 towards my now completed PhD confirmed that archaeologists are increasingly feeling pressured and under-valued in their working environment, and that these sentiments are actually justified by the socio-political pressures in which their work is embedded.

In this presentation, I introduce how the historic environment's struggle within the changing policies of the planning process in the UK specifically highlight a crisis of democracy and governance. It explores how practices well understood by archaeologists can actually help alleviate some of the issues faced by those tackling problems of governance and democratic processes, and suggests ways forward in these challenging times.

4 **ACCESSING SOCIAL AND ECONOMIC VALUES BY INTERVIEWING STAKEHOLDERS AND LOCAL AUTHORITIES**

Author(s): de Raad, Jesper (Leiden University; Laagland Archeologie; ICOMOS; Blue Shield)

Presentation Format: Oral

In 2017 I interviewed seventeen stakeholders through qualitative interviews using the value typology of Randal Mason, as stated in the Heritage Reader. The selected stakeholders were either representatives of stakeholder organizations or local authorities. The interest of the stakeholders and local authorities for archaeological heritage was measured with both the value typology and the use of a specific participation ladder. In total fifteen carefully selected interview questions were used to initiate a debate who should take responsibility for the care of archaeological monuments and more important why.

At the session 'Archaeology, Heritage and Public Value' I would like to start a debate on how we can use various values typologies. What are the benefits and pitfalls of using a social and economic value typology through interviewing stakeholders and local authorities? How do they interpret a participation ladder in the archaeological heritage management system, and what are their local examples of valuing, caring, and managing archaeological monuments?

5 **THE COSMOPOLITAN APPROACH, A WAY TO BIND HERITAGE VALUES?**

Author(s): Duval, Mélanie (EDYTEM; RARI, Wits University) - Smith, Benjamin (University of Western Australia; RARI, Wits University) - Hoerlé, Stéphane (RARI, Wits University) - Bovet, Lucie (EDYTEM; RARI, Wits University) - Bhengu, Lwazi - Khumalo, Nokukhanya (RARI, Wits University)

Presentation Format: Oral

For the last two decades, the management framework for heritage shifted from one centred on the conservation of sites and monuments (a preservationist approach) to the management of the values underpinning heritage significance (Sullivan 1997; Truscott and Young 2000; de la Torre 2002; Demas 2002; Mason 2002; Mason and Avrami 2002; de la Torre et al. 2005). Linked to the publication of the Burra Charter in 1979, heritage management processes around the world now typically involve the identification of these five types of heritage value at each site and planning around how to sustain and enhance each of these sets of values (e.g. Deacon 2006; Smith 2006a; Seif 2009; Gómez Robles 2010). Whilst values-based heritage management is now nearly universal, aspects of its implementation have been challenged (e.g. Poullos 2010; Araoz 2011). We seek to take this challenge further by focusing on the "Preservation/Heritage Values/Management" triptych with the aim of proposing a new methodology for addressing the values attributed to cultural heritage sites. Combining multidisciplinary and cosmopolitan methods, we propose to move beyond the analysis of the processes of hybridization between attributed heritage values (Duval et al. 2018) and therefore seek to propose a new manner of addressing issues linked to heritage values-based approach. Our proposal is based on our researches done in the Maloti-Drakensberg mountains (South African section), where rock art shelters cross a

suite of social, aesthetic, economic and research dimensions. Their preservation therefore requires a holistic approach amenable to considering the full complexity of their uses and meaning. Through a thematic analysis of the data collected in this area from 2009 to 2017, six cross-cultural interest points have been identified and are discussed. Building upon the history of values-based heritage management, we argue that our results are transferable and useful to draw up heritage management plans.

6 THE SEVEN VIRTUES OF HERITAGE - EVALUATING THE PUBLIC VALUE OF ARCHAEOLOGY

Author(s): van den Dries, Monique (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

Recent survey results (NEARCH-project 2015; Kajda et al. 2018) reveal that in various European countries most members of the public consider archaeology foremost a science, not so much a cultural or leisure activity that plays an important, active role in their personal life. Moreover, in many countries there is still limited active citizenship involved in the daily archaeological practice, in interpretation and in governance and preservation. Politicians and policy makers, on the other hand, expect and encourage citizen involvement and empowerment. They stress that cultural heritage and archaeology has or needs to become a driver of social (and economic) development, as it contributes to the wellbeing and quality of life of citizens. Does this indicate there is a tension or maybe even a fundamental rift between theory and practice, between expectations and possibilities? What do measurements indicate that were so far conducted to understand how heritage is valued and how it affects people's life? This presentation aims to critically evaluate what is or could be the role of archaeology to contribute to objectives like improving quality of life. The author wants to add an evidence-based perspective to the question whether heritage-based social innovation can be put in practice through archaeology and what the sector's limitations seem to be.

7 WHAT VISITOR'S AND LOCAL COMMUNITY THINK ABOUT ARCHAEOLOGICAL SITES? THE STUDY CASE OF THE BASQUE COUNTRY [EUSKADI]

Author(s): Masriera-Esquerria, Clara (Universitat Autònoma de Barcelona) - Martínez-Torrecilla, José Manuel (QARK Empresa Arqueología)

Presentation Format: Oral

This article presents the results of the study carried out during the summer and autumn of 2017 in the Basque Country, with the purpose of knowing the perception of the non-academic visiting public and the local community in relation to the archaeological sites put in value. The study was carried out in fifteen archaeological sites located in the three Basque Provinces (Álava, Gipuzkoa and Bizkaia). The chronological range of the study ranges from the Age of Metals to medieval times, in excavations made and recently curated, as well as works that have been the continuation of an admirable work begun in the nineteenth and twentieth centuries. The evaluation methodology used has been double. On the one hand, the realization of quantitative techniques using the survey, and qualitative techniques with the use of the semi-structured interview. Both methodologies have given us a knowledge of the audiences of archaeological sites in the Basque Country, as well as a map of their management.

8 'WHAT MAKES AN ARCHAEOLOGICAL OBJECT VALUABLE?' AN EXPLORATION OF ATTITUDES AND PRACTICES AMONG ARCHAEOLOGISTS AND METAL DETECTORISTS IN NORWAY

Author(s): Axelsen, Irmelin (Museum of Cultural History University of Oslo)

Presentation Format: Oral

A now yearly average of ~2000 private metal detecting finds are catalogued at Norway's five archaeological museums. Metal detecting finds that are perceived to have little current or future 'scientific value' are returned to the finder or destroyed. Destruction often means that an object is relegated to general waste, and put in the bin. These finds have put a financial strain on an archaeological heritage system that up until recently were unaccustomed with the increasing interest in heritage objects among the public. A system that was also unequipped to cope with the very tangible results of such an interest. For a while, the finds and the search for them caused tension and frequent, heated online debates between archaeologists and metal detectorists.

With the aid of stories told during interviews and narratives discovered in the archaeological find databases I will explore how private metal detecting has affected practices at Norway's museums, and, as a result – how it is also shaping our future ways of working and thinking about archaeological heritage objects. Legal definitions aside, what makes an archaeological object valuable and worthy of protection and preservation? During the last two years, as part of my ongoing PhD project, I have asked archaeologists and hobbyist metal detectorists in Norway to answer this question. Although replies do vary, most fall within two related, and somewhat vague, categories: 'scientific value' and 'potential knowledge'. An objects ability to inform us about how past lives were lived seem to be an important value criteria for both (certain) heritage practitioners and a specific part of the public.

9 HERITAGE AUTHENTICITY IN A GLOBALISED WORLD: SEEKING A COMMON GROUND FOR THE COMPLEXITIES IN WESTERN AND EASTERN CONSERVATION PRACTICES

Author(s): Gao, Qian - Jones, Siân (University of Stirling)

Presentation Format: Oral

Authenticity is a fundamental element in the theoretical and philosophical constitution of heritage conservation. In Western countries, the conservation principles and conventions still largely emphasise the idea of 'minimum intervention', while in Eastern countries like China the international guidelines on heritage conservation are inclined to be employed in more "creative"

manners. Nevertheless, all conservation practices involve accepting a level of modification, which potentially poses a threat to the maintenance of authenticity. How to maintain the wholeness, truthfulness and realness of heritage sites in conservation practices remains a universal quandary. The Nara Document is undoubtedly a landmark in the establishment of overarching policy frameworks and conservation philosophies at an international level that correctively go beyond the Eurocentric focus on materiality. However, discussions regarding a relativisation of the notion of authenticity have also contributed to the creation of oppositions between Eastern and Western, indigenous and non-indigenous perspectives, making us blind to the 'common complexities' of authenticity despite cultural boundaries.

This paper aims to analyse the complexities of authenticity in both Western and Eastern contexts, following the recently developed argument that authenticity is produced and negotiated through networks of relationships between people, places and objects. Drawing on ethnographic research focusing on heritage sites in Scotland and China, we reflect on the bifurcation of heritage practices in relation to authenticity in different cultural scenarios and highlight common threads. We suggest that, when practicing heritage conservation, the consideration of authenticity should be more concerned with the extent to which people who consume the heritage are able to incorporate themselves into the networks of relationships invoked by the heritage. The material fabric and the forms of intervention applied to the heritage are just elements that affect people's experience of its authenticity.

10 VISITORS' PERCEPTIONS OF THE RIGHT-OF-WAY PATHS IN THE AVEBURY WORLD HERITAGE SITE AND THE RIDGEWAY NATIONAL TRAIL

Author(s): Croll, Kathryn (University College Dublin)

Presentation Format: Oral

National Trails and right-of-way paths in the United Kingdom form part of a highly-valued network of paths across the country which provide access to both natural and cultural heritage to the public at no cost. This study assessed visitors' and users' perceptions of right-of-way paths within the Avebury World Heritage Site and along the Ridgeway National Trail. The study utilised questionnaires and interviews to determine users' perception of the environmental degradation to the paths, and what values the visitors and users ascribed to the paths. The study determined that regular users of the paths were generally not aware that they caused an environmental impact by using the paths and that they valued the paths more for the free access to the countryside that they provide than for the biodiversity or archaeology that can be found along the paths. Visitors to the Avebury World Heritage Site were generally not aware that they could use the right-of-way paths to move through the landscape and as a result they drove to specific sites and then left. The implications of this study are that the management of the Avebury World Heritage Site and the Ridgeway National Trail should provide adequate signposting and information boards along the paths to raise awareness of the heritage and biodiversity found along the paths and highlight the impact caused to the paths, the surrounding environment and the archaeology nearby. There is an urgent need to address the way the public views National Heritage spaces since they often do not view them as heritage spaces unless that is made explicit.

11 TOWARDS A CRITICAL ARCHAEOLOGICAL MUSEUM

Author(s): Stobiecka, Monika (Faculty of "Artes Liberales", University of Warsaw)

Presentation Format: Oral

In my talk, I will reflect on the future of archaeological museum as an institution that is actively engaged in public debates on current social, cultural and economic problems (climate change, migration crisis, nationalism), and serves as an instrument of democratic education. I would discuss an idea of a "critical archaeological museum" inspired by the project of a "critical museum" developed by the Polish art historian and critic - Piotr Piotrowski. I am particularly interested in Piotrowski's claim that a boundary condition for a critical museum is its close relation to the valid paradigms and theories discussed in academic circles. For Piotrowski, only by (re)connecting museums and academies, museums can actively engage in on-going social discussions and debates.

My speech will be illustrated with contemporary Polish artwork by Agnieszka Kalinowska, "Heavy water," an urban installation consisted of African vessels' copies that, according to artist's intention, illustrate the migration crisis. I will show that a contemporary artwork inspired by archaeological objects and researches is more effective in bringing up important planetary problems than archaeological museums, that ignore present and instead focus on petrified past. I will suggest that addressing shared social dilemmas and problems by linking past and present is the best way to rework the public image of archaeological museums and grasp them as future-oriented institutions. I will provide a speculative model of a "critical archaeological museum" that presents archaeology's "Grand Challenges" through contemporary artworks.

12 EXPERIMENTING WITH COLLABORATION: RECIPROCAL VALUE ADDED WHEN HISTORIC SITES AND STEM INITIATIVES CONNECT

Author(s): Hartford, Samantha (Cooper Gristmill, Morris County Park Commission)

Presentation Format: Oral

In the US, STEM (Science, Technology, Engineering, and Math) education is greatly valued by schools, funding organizations, and start-up companies. Though STEM curriculum often involves science museums, it is uncommon for a historic site to participate in such an initiative -- and thus heritage is seen to lack value where STEM education is concerned. However, in planning for long-

term connections with local communities, educational outreach in all fields can increase the value of a historic site, and many aspects of history can inform lessons on science and technology. This paper follows the case of Cooper Gristmill, a historic mill site in New Jersey, and its participation in a state-wide STEM event. What the historic site can offer for STEM education, and what it gets in return, are evaluated; as are the process of collaboration with the event organizers before and after the event, the sustainability of any partnerships created, and the impact of the event on site visitation.

13 “CARRYING THE BOAT BACK TO THE LAKE” – AN OPEN-AIR SHOWCASE FOR THE ELDEST LOGBOAT OF SWITZERLAND

Author(s): Chevallier, Barbara (Archaeological Service of the Canton of Bern) - Yoshida, Maruchi (Kurecon)

Presentation Format: Oral

The discovery of the eldest known logboat in Switzerland (4500 BC), during a rescue excavation on the lido of Moosseedorf came as a positive surprise to the local community. While the archaeological site inventory testifies to an intense occupation of the area in Mesolithic and Neolithic periods of high scientific value, the acute demand to expand the commercial hub is a welcome manna for the region. The authorities are often confronted with the conflicting interests of the protection of the historical and natural heritage and those of the economic development. The project “carrying the boat back to the lake” is born from the will of the municipality to return to its citizens an original witness of their history and that of the archaeological service to promote its activity and know-how.

What started as a simple wish to exhibit the dugout in an open-air showcase next to its find spot was a challenging venture. The respect of the legal and financial framework regarding the protection of the environment and the use of public money, the technical feasibility to fulfill conservation requirements in a freestanding showcase and finally the decision to endorse the project were obstacles to overcome. Different cross-sectoral partners assessed together the risks and agreed upon the sharing of responsibility for an unprecedented project. This endeavor required from each contributor to reach beyond his own domain of expertise.

This project describes a journey full of unexpected adventures combining a high degree of technical and financial effort on a small spot of 20 m². This contribution shows the necessity to create a dynamic and open project culture in order to bridge individual, economic, scientific and professional interests for an overall aim: preserving a cultural artifact and highlighting it as cultural and technical achievement of mankind in the past and today.

175 RESEARCH DATA AND DIGITAL CORPORA: FROM ARCHAEOLOGICAL FINDINGS TO ARTEFACTS OF THE FUTURE

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Wigg-Wolf, David (Römisch-Germanische Kommission - RGK- des Deutschen Archäologischen Instituts) - May, Keith (Historic England; University of South Wales) - Hofmann, Kerstin (Römisch-Germanische Kommission - RGK - des Deutschen Archäologischen Instituts) - Nimura, Courtney (School of Archaeology, University of Oxford)

Format: Regular session

Corpora are central epistemic instruments for studying the ancient world. In an age of discussion about post-factualism, they can make the production of knowledge more transparent. But while corpora of ancient texts (‘text-editions’) have established a science of their own, to date there have been few studies of the epistemological basis and practices of knowledge production for corpora of ancient objects (‘thing-editions’). Such studies are all the more important given that we are currently faced with the challenge of how archaeological remains can be (re)presented digitally in their materiality and rich diversity.

During the course of digitisation, it is important to revisit questions that already arose in the 19th century. On the other hand, the EAC’s Amersfoort Agenda (Schut et al. 2015) sets out some very useful pointers for addressing the challenges of the 3rd science revolution and highlights the need for some serious reconsideration, or “re-engineering”, of archaeological processes that were established in a different era when many of the tools we now have for data recording; analysis; research synthesis; and publication, were simply not available.

With such considerations in mind, our session aims to direct attention towards both the history of knowledge and the digital future of ‘thing-editions’. A particular focus will be placed on the role of digital corpora as an important tool for the preservation of cultural heritage internationally. Inasmuch as publishing research data make a substantial contribution towards the democratisation of knowledge and information, a discussion of the ethics and governance of digitisation is vital. This session will also consider ways of encouraging and supporting better sharing and re-use of heritage data, including:

- cooperative and multidisciplinary research tools;
- open access data and publication;
- wider use of open source software;
- Communities of Practice for IT users;
- FAIR digital data standards.

ABSTRACTS

1 OBJECT EPISTEMOLOGIES AND THE PRACTICES OF EDITING THINGS: AN INTRODUCTION

Author(s): Hofmann, Kerstin - Wigg-Wolf, David (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

Object epistemologies (after Markus Hilgert) address the question of how multiple and variable object identities arise when dealing with things, and how they in turn affect epistemic practices. This is not just an academic question, but also has social, economic, political and ethical dimensions. Corpora are a central epistemic instrument of knowledge generation for the archaeology of the Western World. But for a long time they were regarded as old-fashioned and part of an antiquarian tradition. This has, however, changed now that everyone is talking about digitisation and research data management; attention has turned once more to various strategies and the politics of representation, and in the course of the debate on (post-)factualism and cultures of knowledge and data we are striving to render the production of knowledge more visible and comprehensible. Following Bruno Latour, editions can be interpreted as translations and products of a praxeological connection between the world and representations. But who (should) own(s) the objects and their representations, who sets the agenda, and who is allowed to join the new democratic (?) projects for editing archaeological findings (citizen science versus knowledge by authority). How do we deal with colonial objects and negative heritage? How can we better do justice to things, beyond the usual classifications and description logics; must things in editions always become frozen as objects? These and other questions will be raised in our introduction.

2 MAKING ARCHAEOLOGICAL DATA FAIR

Author(s): Richards, Julian (Archaeology Data Service, University of York)

Presentation Format: Oral

My contribution will discuss recent developments in European e-infrastructures for research, including ARIADNEplus, E-RIHS (European Research Infrastructure for Heritage Science) and SSHOC (Social Sciences and Humanities Open Cloud). These initiatives are helping foster an Open Access approach to data, and a FAIR approach to data management, but it is important that archaeologists engaged with these organisations, so that the importance of our research is reflected in wider European agendas. The Archaeology Data Service (ADS) is playing a part in each, and I will briefly introduce our contribution and seek feedback on the best ways for archaeologists to engage with them. For ARIADNEplus I will introduce the task forces charged with surveying, collecting, creating and managing multilingual domain thesauri and vocabularies which are essential for data integration within the ARIADNE e-infrastructure. These cover fields as diverse as human palaeo-biology and paleo-environments, analytical investigations, archaeological prospection, standing structures, fieldwork, metal-detector surveys, and archaeological finds and inscriptions.

3 MASS FINDS FROM THE FORCED LABOUR CAMP TEMPELHOF, BERLIN: EXPLOITING NEW POSSIBILITIES OF INTERPRETATION USING A RELATIONAL DATABASE

Author(s): Misterek, Kathrin - Stern, Judith (Freie Universität Berlin)

Presentation Format: Oral

The access to large quantities of archaeological artefacts can often only be established using new methods of inventory.

Although mass finds make up the majority of the objects recovered on modern excavations, they seem inaccessible for further examination due to their sheer volume and are therefore rarely included in studies. Their potential to provide useful information has been little researched so far. This applies in particular to excavations dealing with contexts from the 20th century, the finds from which pose new challenges to the excavators, not only because of their quantity but also because of their diversity.

The project "Excavation of the Forced Labour Camps on the Tempelhof Airfield, Berlin: Digital Corpus, Analysis and Reconstruction of Living Conditions" examines finds and structures from the Nazi period when thousands of people were forced to build aircraft for the German Luftwaffe. The artefacts consist of a modest number of unique objects and tens of thousands of mass finds, including nails, fragments of glass and porcelain.

The aim of this talk is to present some solutions to the aforementioned challenges as applied within our project. The basis for our evaluation is a specially programmed relational database, which facilitates a systematic recording of finds according to defined categories and criteria. The excavation plan, information on excavated structures and other background data (such as images and text sources) are also available in the database.

This combined approach opens up new possibilities of interpretation. At the same time, however, there is a risk that investigators will become alienated from their objects of investigation: The tens of thousands of finds are primarily accessible as digital datasets, while the physical objects can no longer be accessed, due to their large number or because they cannot all be kept within reach due to limited storage capacity.

4 IMAGE AND OBJECT RECOGNITION AS A BASIS OF DIGITAL CORPUS FORMATION

Author(s): Langner, Martin - Zeckey, Alexander (Georg-August-Universität Göttingen)

Presentation Format: Oral

The goal of these two case-studies is not only to develop procedures for automatically generating corpora using image and 3D pattern recognition, but also to reflect on the associated schematisations and how they can be applied in computer science and visual sciences.

Based on 200 terracottas of the late 4th and 3rd centuries BC, which are quite similar to each other, a classification system will be elaborated with digital methods, which is able to meet the complexity of the artefacts. For this purpose, methods of object-mining in 3D data are to be developed, which support the search for a suitable classification and categorisation of the images. The same holds true for a corpus of 80,000 Athenian Vase-Paintings, which are examined in relation to composition and content. A newly set up project is also trying to automatically attribute a vase to a certain painter.

In close cooperation between computer science and archaeology, these experimental processes thus lead to a fundamental examination of the concept of pattern recognition as a humanities category.

For the question of the relevance of the similarity networks for concrete relationships between the figurines or vases, the use of computers can also provide impulses because it is possible to describe the type and degree of similarity in a comprehensible way. A further goal is to test digital image classification methods by fundamentally investigating the relationship between archaeological hermeneutics, intuitive connoisseurship and data-based objectification of cognition in a central and intensively researched area of Classical Archaeology.

5 LINKING THE ARTEFACTS OF THE FUTURE: HERITAGE LINKED DATA

Author(s): May, Keith (Historic England; University of South Wales - Visiting Research Fellow)

Presentation Format: Oral

Considerable advances have been made through research in exploring ways to develop greater semantic interoperability between existing or newly developed archaeological datasets. In the academic and research domains, where free information exchange and interoperability are more readily adopted principles, the use of semantically enabled data and tools for its creation, such as Natural Language Processing (NLP), has been growing. New approaches to Heritage Data Analytics are also emerging which pose questions about the application of machine learning algorithms to historical and archaeological texts and related data resources, and how the outputs of such work can best be sustained.

With this in mind it will be important for heritage organisations to consider how existing data and digital resources could be kept up to date with such developments, and plan for new data to be recorded and stored in ways that best enable this form of interoperability, so that the digital information remains re-useable by, and relevant to, others into posterity. Research as a result of this, while including new aspects of information management, may go further and open archaeological data up for new areas of cross-domain and interdisciplinary research and data science, including the ability to search and data-mine semantically related information resources that have not been previously interoperable e.g. much greater potential to access and synthesise the information held in, or related by, online archaeological reports produced by many different projects and organisations.

Heritage vocabularies are at the core of many of the recent advances in the interoperability of archaeological information. This paper will give a brief overview of work undertaken in these areas and consider the opportunities and challenges when transforming archaeological vocabularies into Linked Open Data such as those seen at <http://www.heritagedata.org>

6 JOINT NATIONAL OWNERSHIP THROUGH WIDELY VARIED CONNECTIONS. THE FUTURE OF PORTABLE ANTIQUITIES OF THE NETHERLANDS (PAN)

Author(s): Heeren, Stijn (Vrije Universiteit Amsterdam)

Presentation Format: Oral

The project Portable Antiquities of the Netherlands (PAN) studies archaeological finds discovered by private individuals, often using a metal detector, and publishes these online, with the help of both volunteers and professionals. The system uses uniform descriptions ('reference types') in order to process the high volume of finds in a structured way. PAN is therefore both a digital thesaurus for archaeological material culture and a digital publication of collections of antiquities. The database can be searched by the wider public, bulk datasets can be extracted by academics, and connections with DANS (the national trusted repository) ensures the long-term storage and delivery to search engines such as Ariadne.

Although the long-term availability of the digital infrastructure is safeguarded by the National Heritage Agency of the Netherlands, keeping the staff for the data collection is a challenge. Help comes from partners in the regions: even before the set-up-phase of the PAN-projects will end, various parties expressed interest to continue the data collection. It involves many volunteers in various bodies (museums, associations). The local demand for co-creation (real citizen science) provides the clue to solve this particular challenge.

The future looks bright for PAN because of the joint national ownership. This ownership is felt by all parties involved because the system caters for needs of various interest groups at varying levels.

7 FOSTERING FAIR AND OPEN DATA IN SOUTH AMERICAN ARCHAEOLOGY. THE ARGENTINEAN CASE

Author(s): Izeta, Andres - Cattaneo, Roxana (CONICET)

Presentation Format: Oral

Since 2010 various initiatives have been carried out in Argentina in order to establish the bases of repositories dedicated to preserving and sharing data of scientific interest. Archaeology as a scientific discipline has been represented in those spaces by the Digital Archeology Program, which in 2015 established the first thematic repository dedicated to archaeological data. Following the ADS model, databases, images, publications, cartography and grey literature are managed, preserved and hosted among other types of digital objects. Three years after this milestone, the Digital Archeology Program (which is partner of Ariadne Plus) together with the Williams Foundation and CONICET (Argentina's National Research Council) have begun to work on a program aimed at generating interest in the subject of repositories by offering the possibility of generating new spaces or include new information in those already available. This task, based in the notions of open acces, open science and data FAIRness, has just begun but it appears as promising and has undoubtedly changed at the national level the way of seeing, using and preserving archaeological data.

A. MINOR OBJECTS - BIG DATA. HOW TO ADEQUATELY DESCRIBE EVERYDAY OBJECTS

Author(s): Langner, Martin - Janda, Manuel (Georg-August-Universität Göttingen)

Presentation Format: Poster

In relation to Material Culture Studies event based structures are already implemented to Collection Management Systems. These give the possibility to describe the whole lifespan of an object. The problem is that we are usually not able to reconstruct the complete 'biography' of an artefact, and in relation to function the shape (e.g. of a ring or a jug) is more often irrelevant than archaeologists use to believe: form does not necessarily follow function!

The results of a BA thesis concerning a multimodal approach to archaeological databases will be presented answering questions like: Which criteria of categorisation are needed for things of every day life? How does the fluidity of use can be modelled? What can be learnt from actual discussions in Design and Marketing Studies? What kind of help comes from Big Data approaches like Image Content Exploration or Cultural Analytics? Which statistical approach is most appropriate for household studies in terms of every day life?

177 EAA2500 - THINKING THE FUTURE IN ARCHAEOLOGY AND ARCHAEOLOGICAL HERITAGE MANAGEMENT

Theme: Archaeological theory and methods beyond paradigms

Organisers: Holtorf, Cornelius - Högberg, Anders (Linnaeus University) - Fredheim, Harald (University of York)

Format: Regular session

It is often claimed that archaeological heritage is to be preserved for the benefit of future generations. Recently, researchers and practioners have begun to ask what this means. How do different perceptions of the future inform how archaeology is practiced and heritage is managed? Which future do archaeologists and heritage professionals actually work for? What kind of archaeology and heritage will be needed in the future (and how do we know)? How do archaeologists best support cultural resilience or contribute in other ways to sustainable societies? Most importantly, how can we build capacity in future thinking among archaeologists and heritage professionals? This session invites papers that address the need to think and plan for a range of futures in archaeology and archaeological heritage management, so that our work can create the benefits we aim for.

ABSTRACTS

1 ARCHAEOLOGISTS AND THE FUTURE – AN ARRANGED MARRIAGE TO LAST?

Author(s): Holtorf, Cornelius (Linnaeus University)

Presentation Format: Oral

This paper reviews how archaeologists think and reason in relation to the future. The paper starts with a short discussion of existing research on the Archaeology of the Future, from studying implied futures in prehistoric monuments, to applying archaeological knowledge to improving agriculture in unfavourable conditions, to predictions of environmental change. In the second part of the paper, I will turn to future literacy as it is evident (or not) in archaeological heritage management which often aims at preserving material evidence of the past for the benefit of future generations. But how does the practice of archaeological heritage management actually relate to the future? I will discuss in particular some experiences gained during future workshops we have been running over the last few years with archaeologists and heritage managers in Sweden and abroad (see also <http://lnu.se/en/unescochair>). Archaeology and the future may not be love at first sight but is the future here to stay?

2 CHECKING IN WITH DEEP TIME - INTRAGENERATIONAL JUSTICE OR CARE?

Author(s): Fredengren, Christina (Department of Archaeology and Classical Studies / Statens Historiska Museer)

Presentation Format: Oral

This paper approaches the major research question of how to re-tie the material and immaterial knots between past, present and future generations. It discusses the politicization of the long-term within the natural/cultural heritage sectors and the layers of vernacular temporalities that meet and transform on a particular site of present contestation, namely a garbage disposal site and hightech energy-to-waste plant that is situated on an Iron Age archaeological sanctuary in urban mid-Sweden. Starting from this site we attempt a discussion on intergenerational justice and convivial deep time care as it draws on approaches and analytics from critical posthumanism, multispecies humanities/posthumanities and the feminist environmental humanities. What are the possibilities and challenges for deep time interventions and intragenerational ethics? How do the relationships with past and present generations addressed in sustainability efforts gets envisaged? What does multispecies posthumanism bring about that alter discussions on time, presentism, representationalism and critical heritage discourse? From such vantage points we find it important to check in with deep time practices and imaginaries as humanity's short-sighted actions, extractions and consumptions, so far, have become a planetary force with accelerating effects on the biosphere rein in the future for multispecies generations to come.

3 MAKING HERITAGES TOWARDS AD2500: ARCHAEOLOGY AS RECONNECTIONS TO OBJECTS, HERITAGE AS REMEMBERING THINGS

Author(s): Yoshida, Yasuyuki (Center for Cultural Resource Studies, Kanazawa University; Sainsbury Institute for the Study of Japanese Arts and Cultures)

Presentation Format: Oral

This paper is looking at discourses on nuclear power plants and radioactive waste repositories before and after the Great East Japan Earthquake 2011 include a conceptual-designed stone coffin shape nuclear power plant built in Tokyo Bay, art-installations within contaminated areas, and proposals to build tourism sites near the Fukushima Daiichi Nuclear Power Plant. Through the review of the discourses, this paper is thinking of intrinsic features of archaeological thoughts, the conception of heritage, and the possibilities of archaeology and heritage in the distant future. We are using archaeological imaginations to think about objects and landscapes in very different ways from those of our everyday experiences. Therefore, one of the most popular areas of archaeology is still prehistory. Prehistoric objects are most stimulating archaeological imaginations. Archaeological practices might be situated as trials to re-connect objects of the remote past to the "current us" somehow. In AD 2500, some objects of the 21st century that are familiar with us would become subjects of archaeology. On the other hand, making heritage might be situated as trials to allow our inheritors to keep connections to heritage and remember social things through heritage. Nuclear power plants, radioactive waste repositories, and sites of nuclear accidents are likely to become subjects of archaeology in the distant future. Some radioactive waste repositories are planned to be built isolated deep underground, and there are discussions about how to communicate this danger to people in the distant future in verbal, non-verbal, and symbolic ways. Those ideas are premised upon the idea that radioactive waste repositories would become subjects of archaeology. The contrasting idea insists that nuclear facilities should be built-in our society not in isolated forms for remembering them.

4 IMAGINING THE PRACTICE, APPRECIATION AND VALUE OF ARCHAEOLOGY IN THE FUTURE: THREE APPROACHES

Author(s): Fleming, Arlene (The World Bank)

Presentation Format: Oral

This presentation addresses the question proposed in the session abstract: "How can we build capacity in future thinking among archaeologists and heritage professionals?" Lacking the proverbial crystal ball, three approaches are suggested and elaborated to stimulate thought and action by archaeologists regarding the practice, appreciation and value of archaeology and archaeological heritage management in the future. First, we may consider the astonishing advances in archaeological exploration, documentation and analysis during recent decades, and on this basis, predict further advancement. How do we envision further developments and what will be the implications? A second approach should take into account the vast increase in, attention to, and fascination with archaeology, as apparent in academia, financial institutions, private industry the media and the general public. How can the support of these actors be enlisted in the future? They will be needed. Thirdly, it is essential to consider current and projected conditions of life on earth: our increasing consciousness of a changing climate and its repercussions, including migration, conflict, political and economic instability. What are the implications for archaeology? What actions will be necessary for enhancing and curating the archaeological record under these circumstances, and for protecting exposed archaeological material including records - written and virtual - as well as objects and sites? How can knowledge of the past inform the present and future, given the fact that we have archaeological evidence of similar conditions?

5 CONTRACT ARCHAEOLOGY - A FUTURE MAKING BUSINESS

Author(s): Högberg, Anders (Linnaeus University)

Presentation Format: Oral

Contract archaeology is an integrated part of contemporary heritage management, in Europe and beyond. Through knowledge

production, preservation, heritage management and outreach, its results and outcomes have an impact on future society. Consequently, contract archaeology is a contemporary practice working with future making. However, while contract archaeology has dealt in its practice with the contemporary world, its future making practices have not been addressed to any great extent, neither in research nor in heritage management or policy making. In this paper, I will discuss and exemplify aspects on contract archaeology as a future making business, especially drawing on aspects of how to build capacity in future thinking and to develop future literacy, both within contract archaeology specifically and in archaeological heritage management in a broader sense. (And some more words added because the system requires minimum 150 words. It is a bit ridiculous to add words to a system, but as it is needed I do so.)

6 WALL-E WAS AN ARCHAEOLOGIST: FUTURE ARCHAEOLOGY AS AN EXTRACTIVE INDUSTRY

Author(s): Moshenska, Gabriel (University College London, Institute of archaeology)

Presentation Format: Oral

Given that the Capitalocene is an unstoppable engine of death it is obviously vital that we consider the future of archaeology. In this paper I imagine the archaeologists of the future as hybrid scholar-salvagers, studying and recording as they tear apart dead, drowning cities in search of reusable materials.

The current field of preventative archaeology is based on a principle of continuous growth, a view of archaeological heritage as a non-renewable resource, and a laughable reluctance to consider the commodity values of archaeological artefacts. We dig, we archive our finds, and new infrastructure grows from the sterile holes we leave behind. This model – and the global capitalist society that drives it – are unsustainable.

Any survivable future for humanity will rest on limiting growth, on the careful management of resources for sustainability not profit, and on a managed transformation of the material world to meet the needs of a future sustainable society. In this vision of the future, production and growth based on natural resources will by necessity be replaced by a large-scale recycling, repurposing, and managed destruction of the human-made material world. As we build new habitats we will by necessity strip the burned or drowned cities of their wires, pipes, bricks, rebar, structural plastics, organic materials and steel frames, leaving hollow ruins.

Let us therefore imagine the archaeologist of the future: a skilled salvage worker, trained [or programmed – they are unlikely to be human] in both the recognition and retrieval of valuable resources and in their recording and interpretation. The skills in managed destruction remain the same: the fundamental transformation will be in the understanding of archaeology as an extractive industry, of artefacts as commodities destined not for archival stasis but for repurposing in the service of society.

7 TOO MUCH ARCHAEOLOGY?

Author(s): Fredheim, Harald (University of York)

Presentation Format: Oral

Where will we keep all the things we are preserving for future generations?

The Profusion theme of the Heritage Futures project has explored how people make decisions about which everyday objects to keep for the future - in light of all the things that could be collected. Our findings show that despite efforts to collect less and dispose of more objects, most social history museums are adding at least ten new objects for every one they let go.

This paper connects our research into collections development decisions in social history collections with results from the Chartered Institute for Archaeologists' 2017 report on "21st-century Challenges for Archaeology" and the Society for Museum Archaeology's 2018 "Guidance on the Rationalisation of Museum Archaeology Collections" to ask searching questions about the futures of archaeological collections. If we cannot care for all the objects we feel we should keep for the future, should we be revisiting archaeological ethics to reconsider how we can use archaeological objects in the present?

8 DIGGING INTO COLLECTIONS – THE FUTURE OF ARCHAEOLOGICAL HERITAGE PROCESSING IN THE WESTERN BALKANS

Author(s): Cosic, Natalija (Center for Preventive Conservation, Central Institute for Conservation, Belgrade) - Milosavljevic, Monika (University of Belgrade, Faculty of Philosophy, Department of Archaeology)

Presentation Format: Oral

This presentation seeks to illuminate issues in existent and emerging archaeological collections, particularly the method in which they are being (re)valorised for future generations.

Processing practices of archaeological material fall into the overlap of two major disciplines - archaeology and heritage studies, intertwined with a dash of preservation strategies. More than any other discipline dealing with the past, archaeology has a privileged position to produce the subject of its inquiry. It transforms artefacts' values immediately starting from discovery, then through selection practices during excavation and, finally, their interpretation. This mechanism of knowledge production is typically followed by the institutionalization of codified knowledge and transitioning of selected objects into museums. Also, archaeology, heritage studies, and conservation repetitively produce infinite data and documentation legacies, which bears great significance on current and future valorisation of findings. The essence of the conundrum of archaeological heritage lies at the intersection of collecting the past to use in the future.

In the Western Balkans, collecting strategies have remained conservative in nature; hence, their collections do not necessarily

reflect the complexity of the past. The countries of the region are yet impoverished, post-conflict, post-socialist and liberal stabilitocracies, wielding a strong influence on the professional framework of their archaeologies. It is then relevant to posit to what extent these contexts influence, not only current archaeological management and collection strategies, but future ones as well, especially in light of EU standards.

Thus, in order to understand the future of archaeological collecting, we need to dissect the present understanding of traces from the past. To achieve such, the process of collecting and assigning value must receive scrutiny so that future management of archaeological collections in the Western Balkans can be (re)built in line with professional standards that allow for a complex picture of the past.

9 FUTURE OF MUSEUM ARCHAEOLOGY: EXCEPTIONAL, UNIVERSAL OR MONOLITHIC FUTURES?

Author(s): Cvjeticanin, Tatjana (National Museum in Belgrade)

Presentation Format: Oral

Thinking about heritage futures among archaeologist considers museums mainly as repositories and institutions for preservation, listed under the umbrella of heritage or museum management. And yet, musealization (and consequently disposal of objects) or conservation are not the only activities to reflect upon.

Future of museums is currently intensely discussed and future museums are commonly seen as institutions that will “empower people to question different issues”, increasing diversity while “curating experiences” that interconnect communities/society (cf. <https://museum-id.com/the-futuremuseum-project-what-will-museums-be-like-in-the-future-essay-collection/>). The underlying values are cultural diversity and multiple identities, shaping museums as safe spaces for dialogue, forced to change their voice of authority.

How that reflects on the archaeology in museums, particularly archaeological exhibitions?

The examples of several Balkan museums promise univocal, monolithic futures, presenting either political negotiations of identity (Serbia, North Macedonia) or firm and lasting national traits that are not negotiable (Bulgaria, Hungary). Museum professionals here are attuning delicately, intentionally or unintentionally, to the voice of only one stakeholder. Times of transition and uncertainty are ‘softened’ by reinvented glorified national (mnemo)history. The future here seems isolated, bleak. On the other side of the spectrum are the “universal” museums, creating an impressive past for privileged visitors, promising the stability of traditional values of excellence and progress and counteracting the present insecurities.

These examples secure heritage (for the) future only for uniqueness, originality, preciousness and petrify commonly accepted values and prejudices. Preserving those selected pasts might maintain a short-time relevance of those models. On the other hand, since museum professionals in general anticipate the future of their institutions still charged with inequality, centrisms(s), political influences and market forces, the path to truly relevant museum archaeology in the future entails taking an ethical and pro-active position.

10 IT'S ARCHAEOLOGY BUT NOT AS WE KNOW IT: ENVISAGING A FUTURE FOR IN SITU CONSERVATION

Author(s): Allen, Caitlin (The University of Sydney)

Presentation Format: Oral

A 2017 article by Hoberg, Holtorf, May and Wollentz, based on interviews with archaeologists on the subject of heritage futures, observed an absence of effort “to understand how the future will differ from today and how it therefore requires decisions and strategies in the present that differ from what we would think is best for our own society now.” But this begs a number of questions. What do archaeologists think is best for society now? Do these assumptions reflect public perspectives? What are the specific public benefits delivered by archaeology if any? How can the future be predicted and planned for if archaeologists don't understand what is happening in the present?

My doctoral research is demonstrating that the way the products of archaeological work, specifically in situ conservation, are received by the public is poorly understood within the archaeological profession. Interviews and surveys with nearly 100 heritage professionals and 350 users of conserved archaeological sites in urban contexts in Australia have demonstrated a disjunct between intention and reception. This is particularly the case when moving beyond the didactic transmission of archaeological information and the conservation of “heritage values”, to areas such as individual and collective wellbeing and the role of archaeology in creating enjoyable and liveable urban environments.

This evidence-based understanding of relationships between people and archaeological places in the present, indicates new ways of thinking about in situ conservation. A future-making approach where the understood present supports creation of the desired future. One in which archaeological expertise does not try to shape society to appreciate an archaeological view of the past, but rather, the practice of archaeological conservation is shaped by the needs of and benefits to diverse communities.

11 HIC SUNT LEONES: ENVISIONING HERITAGE FUTURE IN A PARTICIPATIVE PRESENT

Author(s): Ripanti, Francesco (University of Pisa)

Presentation Format: Oral

The future of archaeological heritage is usually an unknown territory, as well as the reference to the coming generations that should benefit from it; to fill this knowledge gap, archaeology may acquire relevance in the contemporary society. Community

archaeology projects provide breeding ground for specific participative dynamics, having a influence on the future of the stakeholders and the surrounding territory.

This paper argues that both insider and outsider stakeholders are usually unaware of the values they mutually attach to the site and, consequently, the future scenarios they propose tend to be self-referential. As a result, their proposals often lack feasibility and sustainability. For example, a joint site management between the archaeologists and the resident community depends on the effective involvement of both sides. Heritage professionals may have a pivotal role in highlighting the emerging trends from the participative dynamics' analysis, suggesting various context-based actions that can benefit both the site and its present and future stakeholders.

This paper presents the different participative dynamics and envisioned futures for three case studies investigated within my PhD research. The overall analysis suggests that models like participatory governance – recently ranked among the priorities of the European Union – may work for the future developments of community archaeology projects.

12 A VALUE-BASED APPROACH TO AN INCLUSIVE ARCHAEOLOGICAL HERITAGE MANAGEMENT SYSTEM.

Author(s): de Raad, Jesper (Leiden University; Laagland Archeologie; ICOMOS; Blue Shield)

Presentation Format: Oral

Archaeological heritage is a challenging heritage to manage. Especially, in the Netherlands where most of the archaeological resources lay underground and spatial development plans rapidly influence the landscape. Policy makers, heritage managers, spatial planners, and archaeologist established a management system to protect archaeological heritage for future scientific research.

Current heritage managers have been arguing the benefits of the archaeological resource as a being merely for future scientific research. Modern heritage managers desire towards a new and more value-based approach of the management system. Reinstate the discussion to why for whom and how society desires to reflect upon the past.

In my master research, the communities benefit from their (archaeological) surrounding as a source of inspiration and knowledge. The communities are using the archaeological monuments as an informative guide from past to present. Therefore, the physical access of an archaeological monument, as a place to visit, is seen as an asset to the community. The communities value these sites and feel a social responsibility to take care of the(ir) archaeological monuments.

The session: EAA-2500 - Thinking the future in archaeology and archaeological heritage management aims to address the need to think and plan for a range of futures in archaeological heritage management, we need to work to a benefit we aim for.

Therefore, we need to pass on our current believes and values, preferably in a well-structured value-based heritage management system, to the next generation. Of course, These new generations have the full right to choose 'their' (archaeological) heritage and are responsible to care of the past on their turn in time. Thus, all we can do is pass on our current believes to the next generation. In my opinion, we can do so by including communities in all their multiplicities to archaeological heritage, preferably with a physical place to visit.

178 MACRO WEATHER – MICRO CLIMATE: LOCAL PALAEO-CLIMATE RECONSTRUCTIONS AND SOCIAL RESPONSES AT A HUMAN SCALE

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Hinz, Martin (Institute for Archaeological Sciences, University Bern) - Bleicher, Niels (Office for Urbanism Zürich, Underwater Archaeology and Laboratory for Dendrochronology) - Gronenborn, Detlef (Römisch-Germanisches Zentralmuseum, Leibniz Research Institute for Archaeology, Mainz)

Format: Regular session

Climate fluctuations and the resulting environmental conditions at both local and global levels are frequently interpreted as forces driving or at least influencing prehistoric societal dynamics.

Consequently has the study of human-environment interactions been described as one of the major challenges in archaeology (Kintigh et al. 2014) and possible relations between climate and subsistence have been the subject of several recent projects.

Many of these studies relate on global climate proxies such as the GISP 2 ice cores or total solar irradiance. However, proxies for local climate fluctuations have rarely been identified and tested for their possible relevance for human subsistence or societies. Furthermore, it remains uncertain as to how environmental changes documented in supraregional or even global proxies may have actually affected local environments. The fact that these scale-related problems have often been neglected is certainly a result of the difficulties in finding reliable and high-resolution climate indicators which may be linked with the archaeological record.

In this session, we will examine new and robust methodologies and the re-analysis of old data from new angles. We invite speakers to demonstrate approaches that take a local perspective and explore medium-range social developments in conjunction with local climate archives to investigate their possible interrelationships.

ABSTRACTS

- 1 SCALES OF RESOLUTION: LOCAL, REGIONAL AND SUPRA-REGIONAL CULTURE-CLIMATE COUPLED MODELS**

Author(s): Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum; Johannes-Gutenberg University Mainz) - Strien, Hans-Christoph (Johannes-Gutenberg University Mainz) - Lemmen, Carsten - Wirtz, Kai (Helmholtz-Zentrum Geesthacht)

Presentation Format: Oral

Based on a cycle-based model we investigate how climate proxies of local to regional scope may have shaped the dynamics of simple farming societies in Central Europe. These regional socio-economic dynamics are then compared with proxies of supra-regional explanatory power and their possible effects on large historical processes such as the spread of agriculture. We discuss cross-scale relationships and possible feedback effects between regional and supra-regional cultural processes.

Our study focuses on the Early Neolithic Linear Pottery Culture (LBK), the succeeding Middle Neolithic, and the Young Neolithic Michelsberg Culture in the immediate study area, namely western Central Europe.

While these archaeological cultures differ in their settlement system as well as their economic basis, they nevertheless appear to have undergone similar cycles of social resilience. While climate may have had positive effects on population growth, negative effects on decline as a “triggering force” cannot be observed within the chronological model applied. We therefore propose internal social processes as the main forces for the observed curve progressions.

This hypothesis appears to be applicable across scales.
- 2 THE FEDERMESSER: OLD DATA – NEW PERSPECTIVES**

Author(s): Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań) - Diachenko, Aleksandr (Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv)

Presentation Format: Oral

During the Last Glacial Period (ca. 12,700 to 9,600 BC) the Northern Hemisphere experienced a series of dramatic and relatively fast environmental and climatic changes. These fluctuations, recorded in the Greenland ice-cores and other fossil archives led to a substantial transformation of natural conditions.

The development of research into accurate documentation of climate changes over the past several thousand years allows us to trace them with even 20 years accuracy, which is less than the average life expectancy of any member of a hunter-gatherer community. However, the crucial issue is the synchronization of local climatic fluctuations with the global ones. The equally important question, asked by many researchers, is if these changes affected past human behavior and to what extent.

We would like to present the results of studies focused on Federmesser hunter-gatherers, developing in the Late Glacial on the North European Plain, respond to climate and environmental change over time. To achieve this goal we applied several methods to recognize potential differences in plant succession in various regions of the North European Plain, determine the absolute chronology of climatic changes and identify the chronology of the development of Federmesser in diverse ecological niches.
- 3 MIND THE GAP. PALAEOENVIRONMENTAL EVOLUTION AND POPULATION DYNAMICS DURING THE 8.2 KYR CAL BP EVENT IN THE NE IBERIAN PENINSULA**

Author(s): Ros-Sabé, Eva (Digital Technologies for Social Archaeology - TEDAS, Universitat Autònoma de Barcelona - UAB) - Revelles, Jordi (Institut Català de Paleoeologia Humana i Evolució Social - IPHES) - Piqué, Raquel (Digital Technologies for Social Archaeology - TEDAS, Universitat Autònoma de Barcelona - UAB) - Terradas, Xavier (Archaeology of Social Dynamics - ASD. CSIC-IMF, Barcelona) - Aguilera, Mònica (Crop and Forest Science Department. ETSEA-University of Lleida - UdL)

Presentation Format: Oral

The 8.2 kyr cal BP event has been proposed as the main cause of population dynamics in northeast of Iberian Peninsula prior to the adoption of the agriculture. The chronological gap observed in the archaeological sites in this region between ca. 8.2-7.3 kyr cal BP has been traditionally interpreted as the result of migration to more humid regions. This is the proposed model for the Ebro Valley region, but is not clearly identifiable in the north-eastern inland and coastal areas. On the one hand, depopulation occurred prior to the 8.2 event in some areas and affected places where a very low population density has been documented since the beginning of the Holocene. On the other hand, very few high-resolution proxies allow tracing the effect of the 8.2 climatic event at local scale. Several pollen records from NE Iberia show a limited impact of this cooling event, expressed in slight mesophilous taxa regression and a slight increase in shrubs or grasslands. Other pollen records have not enough chronological resolution. Moreover, other proxies as charcoal analysis represent shorter sequences covering only the previous or later periods, offering, thus, more chronological resolution and local scale data.

The goal of this paper is to assess the impact of climate change in the transition Mesolithic-Neolithic in Northeast of Iberian peninsula (8200-7000 cal BP). The result of analysis of $\delta^{13}C$ of charcoal will be compared with the pollen and charcoal records in order to correlate the climatic evidences with vegetation changes and population dynamics.

4 BUILDING NOVEL COMPOUND-SPECIFIC HYDROGEN ISOTOPE RECORDS RELATING TO PREHISTORIC HUMAN RESPONSES TO CLIMATE CHANGE

Author(s): Roffet-Salque, Melanie (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Marciniak, Arkadiusz (Institute of Archaeology, Adam Mickiewicz University, Poznań) - Valdes, Paul (School of Geographical Sciences, University of Bristol) - Pawłowska, Kamilla (Institute of Geology, Adam Mickiewicz University, Poznań) - Pyzel, Joanna - Czerniak, Lech (Institute of Archaeology and Ethnology, University of Gdańsk) - Krüger, Marta (Institute of Archaeology, Adam Mickiewicz University, Poznań) - Roberts, C. Neil (School of Geography, Earth and Environmental Sciences, Plymouth University) - Pitter, Sharmini (Department of Environmental Earth System Science, Stanford University) - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol)

Presentation Format: Oral

The Neolithisation process is characterised by a shift to permanent food-producing economies. This resulted in vulnerabilities to climate-induced food shortages due to crop failures and livestock deaths, potentially leading to human malnutrition-driven migrations. Reconstructing climate change in prehistory is thus crucial to elucidating the resilience of past populations to extreme climatic events. Such impacts on human populations can be highly regionalised making their detection challenging due to a scarcity of well-dated local or on-site terrestrial palaeoclimate records.

Here we show that climate-driven changes in the hydrogen isotope composition of ancient animal fats preserved in pottery vessels are detectable at archaeological sites. A recent study at the Neolithic site of Çatalhöyük (Turkey) showed that the animal fat δD values covary with the well-known abrupt climate event at 8.2 kyr BP. Furthermore, multiple strands of archaeo(zoo)logical evidence point at major changes in human behaviour at this time. We argue that animal fats from archaeological pottery vessels offer potential as a palaeoprecipitation proxy.

5 RETHINKING THE 8.2. CAL BP EVENT: RESILIENCE AND COLLAPSE IN THE KONYA PLAIN IN CENTRAL ANATOLIA

Author(s): Rosenstock, Eva (Institut für Prähistorische Archäologie, Freie Universität Berlin; Einstein Center Chronoi, Berlin) - Willett, Patrick (Department of Anthropology, SUNY Buffalo; Department of Archaeology, Katholieke Universiteit Leuven) - Anvari, Jana (Institut für Ur- und Frühgeschichte, Universität zu Köln; Institut für Prähistorische Archäologie, Freie Universität Berlin) - Biehl, Peter (Department of Anthropology, SUNY Buffalo)

Presentation Format: Oral

Because of the site's long uninterrupted sequence from ca. 7100 to 5500 BC, Çatalhöyük and its environment are a good case study to scrutinize the multifaceted evidence and short- and long-term impact of and adaptations to the 8.2. event. This paper will discuss the most recent debates in the context of the site of Çatalhöyük in general, and the latest results of the research on its West Mound in particular. It shows that the beginnings of Çatalhöyük West at ca. 6100 BC overlapped seamlessly with the end of the older East Mound, and that the adaptations to environmental changes associated with the 8.2 event are characterized by resilience including a gradual spatial transformation of the settlement within the confines of the East Mound around 8.2, followed by a relocation to the West Mound and a final abandonment of the settlement 5500 BC – including the other settlements on the Konya Plain. With its distinctive pattern of traits resembling the classic levels of the East Mound, traits first attested on the later levels of the East Mound and newly developed features, the data from Çatalhöyük West represent both resilience and collapse surrounding the 8.2 event in Central Anatolia.

6 CHOOSING THE RIGHT SOURCE OF PROXY DATA IN ESTABLISHING THE PALAEO ENVIRONMENT AND CLIMATE OF A REGION

Author(s): Forrester, Colin (Universitat Rovira i Virgili; IPHES)

Presentation Format: Oral

Use of proxy data from specimens such as speleothems, pollen, ice cores, testate amoeba, molluscs to name just a few are well established as a useful methodology in establishing Palaeo environment and climates of a region during the Holocene in Europe. A good source of some of these specimens are cores from Ombrotrophic Peat Bogs.

This paper will demonstrate firstly the seasonality of most palaeoclimate reconstructions and further illustrate that choice of the source of the proxy data can determine the usefulness of that proxy data.

I will demonstrate that using the unique physical, biological and chemical qualities of Ombrotrophic Peat Bogs as a source of informative stable isotopic data has been underutilised and appears to be using only the Oxygen component and ignores other qualities of Sphagnum Moss as Proxy Data.

This paper will demonstrate how that in addition to the Oxygen it is the Carbon and Hydrogen stable isotopic elements that hold key information as to the melting of and receding Ice sheets and Glaciers during the early to mid Holocene and possibly also the reestablishment of the North Atlantic Drift current that affects our climate to this day.

Additionally, a simple aspect of the ombrotrophic nature of these bogs gives a unique insight into the changing climates of a region over a period of time in that they Don't Migrate come winter. I will be illustrating this by a palaeoclimatic case study from the Neolithic onwards based on an ombrotrophic peat bog in midland Ireland.

7 TREE, WHEAT, HUMAN? TREE RINGS AS PROXIES FOR PREHISTORIC ECONOMIC SUCCESS

Author(s): Hinz, Martin (Institut für Archäologische Wissenschaften Uni Bern) - Bleicher, Niels (Unterwasserarchäologie und Labor für Dendrochronologie, Amt für Städtebau, Stadt Zürich)

Presentation Format: Oral

It is well known that climate is not static and has changed in various degrees over the Holocene. It is also well established that plants, such as trees, but also crops, have reacted to certain climate changes. Influences on human societies are mediated through for example, poor harvests, which are not least triggered by negative climatic conditions. If we want to investigate the local effects of climatic changes on economic processes, what could be more obvious than to use the trees for this purpose, which were exposed to the same conditions? After all, the analysis of tree ring data forms the backbone of paleoclimatological assessments.

But are climate proxies like tree rings suitable gauges for economic success and viable indicators for an important source of social stress? And if so – on which spatial and temporal scale and for which societies? A simple transfer of tree rings to cereal harvests is not possible. Different species on given soils react differently to a variety of weather-parameters at different times of the year. In addition, archaeologically obtained tree ring curves are often of a significantly different quality (e.g. shorter) than those explicitly obtained for the purpose of climate reconstruction.

We evaluate published and new, unpublished studies on the problem of reconstructing cereal harvests from tree rings in different regions and epochs. We present inspiring approaches and some failed attempts and possible pitfalls. Important aspects are found in the phenomena of signal stability and microregional differences. We want to highlight new methodological developments in the utilization of tree ring data for ecological-economic reconstruction and discuss the possibilities with case studies.

8 CLIMATE QUESTIONS: INTERDISCIPLINARY PROXIES FOR LOCAL ANSWERS. MICROMORPHOLOGICAL AND PALYNOLOGICAL DATA FROM THE LAKESIDE SETTLEMENT OF LA DRAGA, LAKE BANYOLES

Author(s): Andreaki, Vasiliki (Department of Prehistory, Universitat Autònoma de Barcelona; LAQU - Laboratori d' Arqueologia Quantitativa) - Revelles, Jordi (IPHES, Institut Català de Paleoeologia Humana i Evolució Social, Tarragona; URV, Universitat Rovira i Virgili, Tarragona) - Terradas, Xavier (Archaeology of Social Dynamics, CSIC-IMF, Barcelona)

Presentation Format: Oral

Human-driven decisions in combination with the climate conditions during Early Neolithic must have been one of the crucial factors behind the choice of inhabiting the lacustrine settlement of La Draga (7270-6750 cal BP) (Banyoles, NE Iberia). While, nowadays the prehistoric settlement is found partially under waterlogged conditions, that hasn't always been the case. New soil micromorphological data retrieved from the excavated sectors at La Draga, have shown that the occupation of the settlement happened over a newly exposed shore of lake marsh at close proximity to the lake. The exposure of lake marsh would have occurred by drastic decline of lake water level in the context of a cooling phase, as detected for the period 7400-6900 cal BP in Western Mediterranean (Frigola et al., 2007). Other geomorphological changes after or during the Neolithic occupation include the ground subsidence and the formation of sinkholes, and the effects those had on the sedimentary record, explaining why part of the Neolithic settlement have been under waterlogged conditions since Neolithic times. Their subsequent correlation with the pollen results retrieved also from the same sectors help, on a next stage, to decipher the impact in vegetation of the abovementioned climatic and sedimentological events. Palaeoenvironmental evolution would have been affected by anthropogenic (i.e. associated deforestation processes and input of terrigenous sediments from the inland) as well as by climate factors (water-level fluctuations and subsidence events) during Early Neolithic at the site of La Draga.

9 IDENTIFYING REFUGIAL AREAS DURING ABRUPT AND PROTRACTED CLIMATE CHANGE USING ARCHAEOLOGICAL, PALEOCLIMATIC, AND GEOSPATIAL DATA

Author(s): Vining, Benjamin (University of Arkansas)

Presentation Format: Oral

Microenvironments offer crucial refugia that enable ecological adaptations during both abrupt climatic events as well as long term state changes. Microclimates in mountainous regions are particularly important in this process, where they can form cryptic refugia. Locating and understanding ecological dynamics in these settings can be difficult. This paper presents two cases where archaeological data, geospatial modeling, and paleoclimatic data help identify refugial environments and characterize hydroclimatic responses to past paleoenvironments. The examples come from the mountainous Andean region of Peru. Past and current precipitation in this region is highly variable, and localized conditions are crucial for understanding paleo-hydroclimates. Paleoclimate and remote sensing data help to contextualize ecological function within hydroclimate reconstructions, while archaeological data help to identify specific areas that could sustain ecological communities. Combined, this approach helps not only to understand past human – climatic interactions, but further enables us to identify cryptic microenvironments that can be crucial for addressing future climate change impacts.

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Hingley, Richard (Durham University) - Bonacchi, Chiara (University of Stirling) - Lorenzon, Marta (University of Helsinki) - Peyronel, Luca (University of Milan) - Vannini, Guido (University of Florence)

Format: Regular session

This session focuses on the topical theme of frontiers, exploring the ways that ancient and recent borderworks are brought to life, including through re-constructions, living history, festivals and through digital applications online and onsite.

We are interested in examining how this heritage forms and is expressed throughout Europe, the Mediterranean and neighbouring territories such as the Near East, and via a wide range of case studies and interdisciplinary methodologies. By doing so, we hope to build more in depth understanding of the ways in which 'the frontier', as a historical structure, has been experienced in the past and is experienced today. Furthermore, we aim at discussing the meanings that different communities assign to it by means of interacting with the material evidence that such structure preserves in the present.

We welcome papers that address one or more of the following questions, drawing on archaeological, historical and anthropological approaches: how are frontiers and borders from different times and places perceived and lived now? How do borderworks shape ancient and modern identities? What are the multiple ways that frontiers through time are brought together through performance and separated through analytical reasoning? What does this tell us about contemporary people's relationship with frontiers, the risks and hopes they see in them?

The session aims to build on three projects: the debates about the heritage of the Frontiers of the Roman Empire World Heritage Site (Mills 2013), the ongoing work of the Ancient Identities in Modern Britain project (see <http://ancientidentities.org>), and the Ancient Near Eastern Empires programme (www.helsinki.fi/ancient-near-eastern-empires).

N. Mills (ed. 2013). Presenting the Romans: Interpreting the Frontiers of the Roman Empire World Heritage Site. Mills, N. Boydell & Brewer

ABSTRACTS

1 SLIDING BORDERS: SOME REFLECTIONS ON THE INTERACTION BETWEEN NOMADS AND SETTLERS THROUGH THE AGES IN THE NEAR EAST

Author(s): Peyronel, Luca (University of Milan)

Presentation Format: Oral

The paper deals with the perception of frontiers and borders between nomad and settled people in the Near East from the ancient to modern times. Examining a series of cases ranging from the Bronze Age to the Islamic period, the level of integration/segregation between nomadic and urban societies will be discussed, taking into account the material evidence (archaeological and textual) of physical and/or immaterial barriers. The development of a dimorphic society in the ancient Near East has been advocated to explain the strong interaction between semi-nomadic people and agricultural centers along the valley of the Euphrates as a persistent and structural element of the organization of the political entities during the Bronze Age. However the presence of a long stone wall running tens of kilometers along the so-called arid margins in the steppic region of central and northern inner Syria testifies for the presence of some kind of border at that time, while inscriptions from Mesopotamia stated the erection of a defensive wall to protect the territory from the 'nomadic' Martu people. At the time of the great empires (Assyrian, Babylonian, Achaemenid, Parthian and Sasanian) various modalities of interactions with the tribal groups can be identified in the political control through the provincial system and related with geographical boundaries. The nomadism of the Arabian tribes emerged also during the 1st millennium BC, gaining a strong importance through the control of the caravan routes linking the Arabia Felix with the Levant. How is the existence of modern political frontiers interrelated with these structures of ancient societies? and how is the surviving spatial distribution of archaeological remains reflecting such models of interactions?

2 EGYPT AND SUDAN: A LONG-STANDING FRONTIER AND A NEW COMPLICATED BORDER

Author(s): Lorenzon, Marta (University of Helsinki)

Presentation Format: Oral

Since pharaonic times, the border between Egypt and Sudan has been a tangible, but also a supple element of the relationship between these two countries. The frontier, which is well documented through archaeological evidence, has undergone multiple diachronic changes alongside its conceptualization as a cultural, geographical or political representation. This is well reflected on the diverse effects that the inclusion- or exclusion- of local communities in one of the two countries' narratives has had in the past.

This paper discusses the archaeological data regarding the frontier and their impact on modern narratives. It also examines the definition of 'otherness' in relation to past and present community identity.

This presentation aims not only to investigate the Egyptian-Sudanese frontiers through the detailed analysis of the archaeological data, but also to reflect on the modern conceptualisation of borders, and its impact on the local communities to highlight the opportunistic uses of concepts such as 'frontier', 'others', 'community' and 'strangers' taken from the archaeological context to

the current political debate.

3 DOOMED BY THE DAM? RIGHT TO SHARED HERITAGE IN THE ANCIENT FRONTIER CITY OF HASANKEYF

Author(s): Ikiz Kaya, Deniz (Eindhoven University of Technology; Ozyegin University)

Presentation Format: Oral

A complex array of political and socio-cultural logics contributes to the representation and protection of shared heritage, often through various expressions of conflicting interests, emotions and interactions among a wide range of stakeholders. This paper will focus on the case of Hasankeyf, a still-inhabited ancient frontier city in southeast Turkey that is due to be fully submerged by floodwaters of a dam project and thus planned to be relocated to a remote settlement with its local inhabitants and several cultural properties. It will thus explore the actors involved in the protection of this living frontier heritage in case of urban change, analyse their expressions of conflicting priorities and reactions to the case, their involvement in the decision making and will assess their impacts on reclaiming their right to shared heritage. Hasankeyf is a cultural landscape of universal significance that sparks ongoing debates about the management of change in cultural landscapes, methods of preservation, ongoing salvage campaigns, as well as the diversity of contested urban histories and discourses. Going beyond the concern for architectural conservation limited to the protection of the built heritage, this paper will further examine the various narratives and oral histories of the actors concerned about the safeguarding of this historic landscape. In this way, a new methodology incorporating social network analysis and decision modelling into ethnographic methodology will also be introduced to assess the interpretation, presentation and protection of the shared built heritage inherited from culturally and ethnically distinct communities. In sum, this paper will contribute to the field of cultural heritage through the introduction of a novel case, an innovative methodological approach and a distinct perspective that examines the interactions among a wide range of actors, their reactions to change and impact on the right to shared heritage at frontiers.

4 HADRIAN'S WALL AS A 'POST-NATIONAL BORDER'

Author(s): Hingley, Richard (Dept. of Archaeology, University of Durham)

Presentation Format: Oral

This paper explores the recent afterlife of the Roman Frontier work, Hadrian's Wall, addressing the concept of 'post-national border'. Cooper and Rumford (2013) have developed this concept. Exploring practices, including art works and festivals, that have occurred on former borders that once served to separate peoples and states, they address the transformative and inclusive character of such installations and events.

This paper interprets Hadrian's Wall as a place of encounter and commemoration. Addressing several festivals that have been held along the line of the monument from 2000 to 2017, it explores the roles of re-enactment and living history in bringing the monument to public attention. Also considered are events and installations that may help to challenge popular understandings of current bordering and mobilities (Hingley 2018).

Cooper, A. and Rumford, C. 2013. Monumentalising the Border: Bordering through connectivity. *Mobilities* 8(1): 107-124.

Hingley, R. 2018. 'Frontiers and mobilities: The Frontiers of the Roman Empire and Europe', *European Journal of Archaeology* 21(1): 78-95.

5 FRONTIERS ARE NOT BORDERS

Author(s): Vannini, Guido (Università degli Studi Firenze)

Presentation Format: Oral

For a long time, frontiers have been assumed by historians, as an interpretive lens to understand cultural and identity-related aspects of the local communities. The concept of 'frontier' also has fascinating semantic polyvalence which apply to both spatial and temporal dimensions, sometimes simultaneously. Time and space: the classical dimensions with which archaeologists work.

More recently, archaeologists have shown interest in this analytical 'tool' to further our knowledge of past societies. This attention has been encouraged by contemporary politics, the history of tomorrow. This happened for the Roman limes, with research spanning widely from Hadrian's Wall to the limes arabicus. For the Middle-Ages the archaeological mission of the University of Florence 'Medieval Petra' has been examining the frontier re-emerged in southern Jordan from the 12th century, revealing how it was lived by Crusaders, Ayyubids and Mamluks (between the Latin Kingdom, Syria, Egypt) in ways that are comparable to those of other contemporaneous frontiers of the Mediterranean and very different from the previous Roman-Byzantine.

Then, there is the perception of the frontier but which also constitutes a historical fact and, both in medieval-modern times, has produced concrete historical outcomes. A change and consolidation that, in the *longue durée*, crosses, a Europe in which frontiers have no borders (it is anything but an oxymoron) and fuel the construction of fluid identities. Examples range from late medieval-modern Pomerania, to the Spains of the Reconquista, to Crusader states. Until the tragedy of the age of 'borders' and of nationalisms, and the consequent 'fossil identities', Valmy 1792 - Sarajevo 1992. This was a parenthesis of two centuries out of twenty (and the Roman frontiers were only external) but, until a few years ago, were perceived as 'natural'. The hope is not return to this historically 'reactionary' conception understanding of frontiers and identities.

6 FRONTIERS CAME LAST

Author(s): Casalini, Elena (University of Roma 3; University of Florence)

Presentation Format: Oral

In the so called medieval Islamic world frontiers were a flexible, almost non-existing concept. Following from east to west, the steps of Ibn Battuta, and from west to east those of Marco Polo, literary sources may enlighten contemporary researchers on the transparent borders that used to shape countries and empires. The aim of this paper is to focus on the strong continuity that we can see characterizes the architecture and the material culture of sites among the different states that are actually part of the Rojava, the recently formed Kurdish state. Since Kurdish people have lived among the Ilkhanid, then Timurid, then Safavid and Ottoman era as an active and vital part of the cited Islamic empires, on a geographical area that covers Afghanistan, Iraq, Turkey, Armenia and Iran, this research aims to explore the cultural modernity of the frontiers' issue of Kurdistan (of which the Rojava state, even if recognized, would be only a part). Frontiers and state didn't exist as long as the Islamic broad empire system lasted, therefore Kurdish people are one of the best examples of cultural identity in an outstanding continuity of tastes, trades, fashions, items, that managed to survive without geographical boundaries until the twentieth century. The creation of a Kurdish state rises therefore many questions, also for the cultural and archaeological sites.

7 LIVING WITH LIMINALITY ALONG THE ANGLO-WELSH BORDER: MONUMENTS, MYTHS AND MIGRATION OVER THE LONGUE DURÉE

Author(s): Roxby-Mackey, Melanie (University of Birmingham)

Presentation Format: Oral

Protecting, researching and interpreting the Early Medieval archaeology of the Anglo-Welsh border presents both challenges and opportunities. Offa's Dyke in particular, over its (disputed) 132 km course crosses two countries, six local government districts and innumerable sections of publicly and privately-owned land. It traverses a liminal environment with some serious time depth. Through its landscape, place-name and documentary evidence this is a demonstrably different, transitional space to its neighbours from prehistory through to the present day.

This is a landscape subject to differing narratives. The vibrant local version is driven by the complexities of living in this culturally unique space and stands in contrast to those of England and Wales, narratives that have traditionally been less concerned with this unfashionably liminal space within the UK.

But circumstances and fashions change. Following the UK's vote to leave the EU polls now show that the Welsh and English West Midlands narratives on remaining or leaving are polarising. Concurrently, the Early Medieval period is becoming increasingly co-opted into the origin myths of English right-wing politics. On the thorny subject of migration, residents on either side of the border are less concerned with arrivals from the EU than they are with those from the prosperous English Home Counties who they see as driving up house prices beyond their reach.

These are economically and culturally challenging times for the Offa's Dyke Association, an independent, community-based voluntary organisation concerned with protecting and promoting the heritage of this border landscape. What are the most effective means to maintain the integrity of the region's archaeology, to engage with national and international audiences whilst also ensuring relevance to local communities on both sides of the border? This paper discusses the experiences of those working in and with the Offa's Dyke Association in finding solutions to these complex issues.

8 FRONTIER SYMBOLISM IN EUROPEAN AND US RIGHT-WING POPULISM

Author(s): Bonacchi, Chiara (University of Stirling)

Presentation Format: Oral

This paper will discuss how frontiers, borders and walls of the past (ancient to more recent) are used by right-wing populist parties in Europe and the US today. How have politicians been leveraging these concepts and their material and immaterial features to forge easy-to-consume narratives informed by nostalgia? Why should we study these political meanings of heritage and how can this research be helpful to shed further light on contemporary politics and society? Drawing on social media data, analysed through a mixed quantitative and qualitative approach, I will seek answers to the questions mentioned above. The presentation is informed by work undertaken on this topic in order to prepare a monograph (forthcoming), written in the context of the project 'Ancient Identities in Modern Britain' (2016-2019), funded by the UK Arts and Humanities Research Council. The project is a collaboration between the University of Durham (Archaeology and Anthropology) and the University of Stirling.

180 GENDER IS BURNING! 10 YEARS OF AGE COMMUNITY AND THE CURRENT STATE IN GENDER ARCHAEOLOGY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Matic, Uros (Institute for Egyptology and Coptic Studies, University of Muenster) - Sanchez Romero, Margarita (Department of Prehistory and Archaeology, University of Granada) - Coltofean, Laura (Department of History and Archaeology, University of Barcelona)

Format: Round table

The proposal for an EAA community on Gender and Archaeology in Europe, came at the EAA session "Gender, Identity and Mate-

riality” organized in Malta (2008). The first official action of the community “Archaeology and gender in Europe” (AGE) was the organization of a round table “Gender and Archaeology in Europe” in Riva del Garda (2009). Ten years have passed since the forming of AGE – ten years which, in many aspects, have been quite worrying at a global level. We have, for instance, witnessed the rise of nationalist and right-wing ideologies in many European countries and beyond. This has resulted in attempts to ban university programs in gender studies outside archaeology, based on the argument that they represent ideology rather than science. Some have questioned the validity of awards for female scientists, and invoked political reasons for achieving gender equality through these awards. At the same time, several groups have demonstrated increased levels of sexual harassment in archaeology. This roundtable aims to reflect upon these matters in the context of gender archaeology. What is the situation of gender in archaeology today? What changes have these last ten years brought? What is the role of AGE as a community in these matters and what should be its future trajectory? We invite contributors to explore topics such as the incorporation of gender-related themes in contemporary archaeological education and investigation, in university programs and agendas of research institutes; sexual harassment in archaeology; as well as LGBTQ rights and the use of archaeology in homo-nationalist discourses.

1 THE SCHOOL WORKSHOPS OF ARCHEOLOGY: AN EVALUATION FROM THE GENDER PERSPECTIVE

Author(s): Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona) - González-Marcén, Paloma (Universitat Autònoma de Barcelona)

Presentation Format: Oral

From the field of archeology and education, school workshops have had a remarkable success due to its attractive hands on activities, based frequently on active methodologies and school learning by discovery. Emphasis on the contribution of archaeology to the learning and procedures has resulted to a lower in deepening the conceptual and historical contents in these workshops. This is especially relevant making reference to the introduction of gender perspective in education of archeology, where schools work about archaeological methods or experiments and they are designed as neutral activities, but they are not. In this text, we briefly pretend to review what gender archaeology has contributed from academia and in which way it can be applied to the formal education institutions, specifically in the proposals of activities of primary and secondary school workshops, but also to early childhood activities. Taking into account this principle, we will expose some study cases that have been designed by us.

181 SANCTUARIES OF EUBOEA ISLAND (GREECE) AND ITS COLONIES: RECENT EXCAVATIONS AND STUDIES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Krapf, Tobias (Swiss School of Archaeology in Greece; University of Basel) - Reber, Karl (Swiss School of Archaeology in Greece; University of Lausanne) - Huber, Sandrine (University of Lille)

Format: Regular session

The island of Euboea, the second largest of Greece, lies in a prominent position between the Aegean Sea and the Greek mainland on one of the most important sea routes. Its poleis were influential in the Greek world through the foundation of trading posts and colonies in the Mediterranean, in particular in the North Aegean and in Southern Italy. On their journeys Euboean traders and oikists brought with them the cults and mythologies of their mother cities, whereas some Euboean sanctuaries had also affiliated cults on the Greek mainland.

Recently, several archaeological projects have focused on the exploration of the island’s sanctuaries, which were not only ritual centres, but also regional landmarks (e.g. Cape Artemision), crucial for understanding the topography of the island. The identification in 2017 of the extra-urban sanctuary of Artemis Amarysia at Amarynthos by the Swiss School of Archaeology in Greece and the Ephorate of Antiquities of Euboea is a major step in the study of the cults of the polis of Eretria and its geography. A series of further sanctuaries are currently being investigated on the island, using interdisciplinary approaches such as zooarchaeology, and they yield significant new insights on rituals and cults on Euboea, from Chalkis down to Karystos in the south.

The present session aims at re-evaluating the religious landscape of the Euboean poleis and their colonies based on new archaeological evidence, obtained through the excavation of cult sites and the study of individual cultic assemblages, on a local to pan-Euboean scale. Comparative studies of Euboean and other Greek sanctuaries, especially those on the opposite coast of the Euboean Gulf, or in the more distant colonial landscapes, might furthermore contribute to the understanding of the island’s cults in a wider context and of the relationships between the mother cities and their colonies through time.

ABSTRACTS

1 KEYNOTE. EXTRAURBAN SANCTUARIES OF EUBOEA ISLAND: STATE OF RESEARCH

Author(s): Reber, Karl (University of Lausanne; Swiss archaeological School in Greece)

Presentation Format: Oral

Euboea, the second largest island of Greece after Crete, is still not very well explored from the archaeological point of view. This is also true for a number of extraurban sanctuaries which in most cases were known only through written and epigraphical sources. The Greek geographer Strabon gives us a list of seven important sanctuaries, among them the sanctuaries of Apollon near Orobiai, Marmarion and Tamynai, the sanctuaries of Poseidon at Geraistos and at Aigai, the sanctuary of Zeus at the Cap

Kenaion and the sanctuary of Artemis Amarynthia near Eretria. Some others need to be added to this list, such as the sanctuary of Artemis Prosoia near Cap Artemision. Most of these sanctuaries have never been excavated and in several cases we don't even know their exact location. Recently, the Swiss Archaeological School in Greece and the Ephorate of Antiquities of Euboea identified the site of the sanctuary of Artemis Amarynthia and the still ongoing excavations will throw a new light on our knowledge of the sacred landscape of the island of Euboea. The aim of this keynote is to give a state of the research concerning the Euboean sanctuaries and, through the example of the discovery of the Artemision of Amarynthos, to show what we might expect in future research programs.

2 KEYNOTE. FROM GESTURES TO TRACES: EUBOEANS IN THE SANCTUARIES AT HOME AND ALONG THE SEA ROUTES

Author(s): Huber, Sandrine (University of Lille; Swiss Archaeological School in Greece)

Presentation Format: Oral

In the context of the circumnavigations of the Mediterranean in the 1st millennium BC, attention has been drawn by the historians mainly to the transfer of gods and sacred objects (the Greek *aphidrumata*), as well as to the constitution of pantheons in the newly established settlements, and to the creation of Mediterranean mythology, while there was less interest in the ritual practices themselves and the traces they have left.

What archaeological traces, then, did rites leave in the places of worship in polytheistic ancient societies? This question deserves further research. Following the Euboeans in the Aegean and further away in the Mediterranean is a good study case, in view of the many cultic assemblages recently excavated on Euboea, in the Aegean, Northern Greece and Italy.

Beyond the architectural remains and material culture, we will therefore investigate the ecofacts and gestures of the ancient people. The aim of this keynote, as an introduction to the session, is to open the discussion on the identity markers of the Euboeans and the local and foreign populations with whom they were in contact at home and overseas.

3 ZARAKES IN SOUTH EUBOEA: CULT CONTINUITY FROM THE LATE GEOMETRIC TO CLASSICAL TIMES

Author(s): Chatzidimitriou, Athina (Ministry of Culture and Sports)

Presentation Format: Oral

This paper aims to present the architectural remains and the finds which are associated with a cult site in Zarakes in the region of Central-Southern Euboea.

Noteworthy among the finds is a relief fragment belonging to a mid-7th century B.C. pithos; it bears a repeating motif of centaurs and, most importantly, an inscription which identifies this site as a sanctuary, in use since the Archaic period.

The continuation of worship in Classical times is documented both by the discovery of black-glazed skyphoi with the inscription IE on their base -the abbreviation of the word sacred- in a 4th century B.C. building, and also by pottery sherds with graffiti and symbols. Moreover, a bronze weight bearing a ram head as a symbol and the inscription Apollonos Delio is indicative of the existence in Zarakes of a cult site, devoted to the homonymous god.

The various dedicatory finds show that the sanctuary was in use from LG to late classical times during which period it flourished. In Hellenistic times it seems to be on decline and is gradually abandoned.

4 RECENT RESEARCH ON THE SANCTUARIES OF PLAKARI AND KARABABA IN THE KARYSTOS REGION, SOUTHERN EUBOIA

Author(s): Crielaard, Jan Paul (Vrije Universiteit Amsterdam)

Presentation Format: Oral

Since 2010 archaeologists of the Vrije Universiteit Amsterdam and the Ephorate of Antiquities of Euboea are engaged in two field work projects in southern Euboea. One is a multidisciplinary project focusing on the excavations at Plakari, most probably the location of Early Iron Age and Archaic Karystos. The other is a combined pedestrian and remote sensing survey, exploring ancient overland roads and routes and infrastructure facilitating maritime communications. The Plakari excavations have brought to light a hilltop cult site functioning between the early 11th and later 4th c. BC. One of the discoveries made during the surveys was a road system connecting Plakari to a rural cult site on the opposite Karababa hill. In my paper I will discuss the character of the cult activities and rituals taking place at Plakari, their spatial, architectural and social setting, and the wider cultic landscape that included the late Archaic-Classical rural sanctuary of Karababa and other cult sites, such as those on Mt Ochi and at Kastri (ancient Geraistos).

5 GRAFFITI AND SMALL FINDS FROM SOUTHERN EUBOEAN SANCTUARY SITES

Author(s): Chidioglou, Maria (National Archaeological Museum, Athens)

Presentation Format: Oral

Short inscriptions or graffiti, mainly of a religious character, that help us identify ancient ceramic and metal objects as part of a cultic assemblage, have been identified on a number of ancient vases and metal accessories found in sanctuary sites in the southern part of the island of Euboea. An example in case is the sanctuary site of Plakari at Karystos, where a large number of small plain and black-glazed vases with graffiti, dated in the 5th and 4th centuries B.C., came to light during recent research,

jointly conducted by the Ephorate of Antiquities of Euboea and the VR University of Amsterdam.

Other similar inscribed ceramic and metal finds from various sites in Euboea are housed in the National Archaeological Museum in Athens, as well as in the Archaeological Museum of Karystos. This paper aims to an overview of the evidence and a preliminary evaluation of the data gathered from inscribed vases and other eloquent small finds from Southern Euboean cultic sites that are dated from the Archaic to the late Hellenistic period.

In conclusion, an attempt will be made to ascertain the relation of the evidence presented above to the cultic landscape of Karystos, the main ancient polis in the southern part of Euboea, a region nearest to central Aegean trade routes.

6 THE SANCTUARY OF ARTEMIS AMARYSIA IN AMARYNTHOS (EUBOEA, GREECE): EXCAVATION RESULTS 2018 AND 2019

Author(s): Krapf, Tobias (Swiss School of Archaeology in Greece) - Knoepfler, Denis (Collège de France; University of Neuchâtel) - Reber, Karl (Swiss School of Archaeology in Greece; University of Lausanne) - Karapaschalidou, Amalia (Ephorate of Antiquities of Euboea) - Theurillat, Thierry - Verdan, Samuel (Swiss School of Archaeology in Greece)

Presentation Format: Oral

The extra-urban sanctuary of Artemis Amarysia in Amarynthos was according to epigraphic and literary sources the most important cult place of Euboea. It was controlled by the city state of Eretria and attracted crowds from the entire island during the festivals of the Artemisia. The identification of the sanctuary in 2017 with the site excavated since 2007 by the Swiss School of Archaeology in Greece and the Ephorate of Antiquities of Euboea east of modern Amarynthos is a milestone in the study of the religious landscape of Euboea and beyond, in a region where several sanctuaries of Artemis are known along the Euboean Gulf. The remains unearthed so far include a large Doric stoa, a sacred well, a monumental Early Archaic building with antae and at least nine other edifices.

The research project funded since 2017 by the Swiss National Science Foundation turned its interest in 2018 to the exploration of the general topography of the sanctuary and the origin of the cult. The current excavation focuses on two main sectors: the central courtyard bordered by porticoes, where the foundations of a monumental base (altar?) and a miniature bronze quiver of a statue were recently found, and the 7th c. BC large public hall which is built above earlier buildings and layers from the Early Iron Age, going back at least to the 10th c. BC. This paper will present the results of the 2018 and 2019 campaigns, the latter – one month after the excavation season – for the first time.

7 CULT PRACTICES IN EARLY IRON AGE OROPOS?

Author(s): Mazarakis Ainian, Alexandros (University of Thessaly)

Presentation Format: Oral

The Early Iron Age metalworking site of Oropos has been extensively excavated since the mid 1980ies onwards, bringing to light a settlement of major importance for our understanding of the formative stages of Greek culture. The site has been identified with Homeric Graia (Iliad 2, 498). Its connection with the island of Euboea and with Eretria in particular, is documented both by the ancient sources and the common material culture which both sites share.

Despite the fact that ca. 40 oval, apsidal and round edifices have been excavated at Oropos, dated in the second half of the eighth century BC, no separate cult building can be definitively identified. Nevertheless, within several domestic or communal edifices, as well as in specific areas open the sky, various forms of cult manifestations may be inferred from the study of the finds and the excavation data. In this paper I will present and discuss all the above mentioned possible cases, which are varied and often complex to interpret. Similar varied uses of edifices and spaces are observed in the opposite coast of the Euboean Gulf, at Lefkandi and Eretria. These, as well as a number other cases from elsewhere in the early Greek World, shed significant light in the cultic behavior of communities at the threshold of the genesis of the city-states. This approach gains further interest since Euboea may be singled out as a geographical area where we witness the birth of a significant number of early monumental temples, both within the urban and extra-urban spaces.

8 THE ROLE OF FEASTING AND COMMENSALITY: COMPARING EUBOEAN SANCTUARIES DURING THE EARLY IRON AGE AND PROTOARCHAIC PERIOD

Author(s): Charalambidou, Polyxeni (University of Warsaw)

Presentation Format: Oral

In recent years and up to today, important archaeological projects at cult sites in Euboea - in central and southern regions of the island - are enabling us, for the first time, to investigate the regional and temporal variation in Euboean feasts through examining the material culture and the active role it played in ritual events.

This paper aims to discuss the role of feasting and commensality in sanctuaries in central and southern Euboea during the Early Iron Age and Protoarchaic period through a comparative approach, based on a range of archaeological evidence in context, for example the forms and functions of buildings/structures, drinking and eating equipment and faunal data. The social roles evidenced in ritual feasts that can indicate social networks, collective cohesion and/or diacritical forms of commensality are explored. The extent of local and regional variation and/or patterns of uniformity in feasting activities across Euboea, alongside an investigation on local/regional/supra-regional dedication practices, is discussed. At the same time, continuity and/or changes

in feasting practices, especially from the Geometric into the Archaic period, are also reviewed.

9 SOME REFLECTIONS ON EUBOEAN SANCTUARIES, CULT PRACTICES AND POLITICS

Author(s): Arjona, Manuel (Independent researcher)

Presentation Format: Oral

Much progress has been made in our knowledge of the sanctuaries of Euboea as a result of the archaeological field surveys, excavations and studies of finds carried out in recent years by a wide number of scholars and institutions. Indeed, recent fieldwork has provided illuminating new evidence on the location and layout of some of the main urban and nonurban sanctuaries of the island. Besides, thorough study and interpretation of votive materials have resulted in major advances in our understanding of the cult activities that took place in these sites from the Early Iron Age to the Roman Period.

In this paper I will highlight several features concerning the sacred landscape of Euboea by combining old and new archaeological data along with literary and epigraphical testimonia. Obviously, I do not aspire to present a comprehensive account of all Euboean cult sites. Rather, I will focus on just a few, albeit, outstanding sanctuaries and will deal with some intriguing issues and processes such as the assignment of new traits to divinities, the appropriation and monumentalization of these cult places and the close relationship between politics and religion in Euboea.

10 CONNECTING THE EAST AND THE WEST: THE TEMPLE OF APOLLO AT ERETRIA

Author(s): Muñoz Sogas, Judith (Universitat Pompeu Fabra)

Presentation Format: Oral

The Sanctuary of Apollo Daphnephoros at Eretria has yielded evidence to connect the sacred building to non-religious functions, such as a meeting point between pan-Euboean cultures and Near Eastern merchants. Eretria and Lefkandi in Euboea have had connections to the East since very early times, especially with places like Al-Mina. Near Eastern and, specifically, Phoenician presence in Eretria, told by Strabo and Herodotus, is believed to be up until the eighth century, and the archaeological record shows how important their presence in the island was.

Inscriptions on locally made pottery and on bronze blinkers from North Syria dedicated to Hazael were found within the temple, some of them showing an alphabetic script, thought to be transmitted by Phoenicians. This temple, therefore, could have been a very significant point of contact between Phoenicians and Euboeans, a place where ritual practices, such as meals and drinking sessions, could have contributed not only to the spread of writing but also to commercial transactions, as well as to the change or adaptation of religious practices and beliefs.

A few oriental objects have been found within the temple, such as Egyptian figurines, scarabs and seals and Phoenician glass beads. Moreover, a goldsmith's working area has been detected near the temple. These finds can be compared to other Aegean sanctuaries like Kommos (Crete), a stopping point between the East and West; the Temple of Artemis Orthia (Sparta), an ivory working space; the Sanctuary of Kition-Bamboula (Cyprus), a point of commercial exchanges with a bronzesmith workshop; and the Heraion of Samos, a Greek sanctuary where Egyptian deities were presumably worshipped.

Therefore, the Temple of Apollo at Eretria can be connected to commercial exchanges between foreigners and locals, as well as to a hybridisation of religious practices that denotes that cultures cannot be understood in isolation.

11 IS IT A MATCH? RELIGIOUS RELATIONS BETWEEN THE ISLAND OF EUBOEA AND THE CHALCIDICE (NORTHERN AEGEAN) RECONSIDERED

Author(s): Denk, Olivia (University of Basel)

Presentation Format: Oral

Within the produced discourse of the Euboean presence and the leading role of Eretria in the early 'colonisation' of the Mediterranean, religious elements were often used as markers to confirm the movement of Euboean cults abroad. Especially in the case of Chalcidice, which represents from the heterogeneous micro-regions of Northern Greece the zone with the strongest southern Greek influence, several cults appealed to correspond with the ones from Euboea. These claimed matches served i.a. as basis to create a colonial perception of Euboeans, who expanded as pioneers of maritime travel their religious traditions into Northern Greece.

The paper aims to present a comparative approach of the religious landscape of Euboea and the sacred topography of the Chalcidian peninsula, based on new results of my doctoral thesis. In the context of the colonial conception of Chalcidice, I follow modern scholar's critical point of view, to provide an updated perspective on the diffusion of Euboean influences in the Protogeometric and Archaic Period, which helps us to identify the provenance of the cults. Taking several cult places of Euboea and of Chalcidice into account, their religious relations will be contrasted based on literary, epigraphic, numismatic and archaeological sources. Various features like the worshiped deities, a specific epithet of a god or architectural elements of a sanctuary function as potential clues to recognize relations between both regions. Concerning the Euboean seafaring in connection with the suggested sea routes to the Northern Aegean, the maritime character of Poseidon as well as the placement of his sanctuaries on Euboea (e.g. Geraistos), will be discussed in comparison with the sanctuary of Poseidi on the Chalcidice. To shed new light on the genesis of religious landscapes the cults of Stageira, Ouranopolis and Akanthos need to be analysed within the historical background of Chalcis and its relations to Andros.

NEW PERSPECTIVE ON POTTERY STUDIES: UNDERSTANDING THE CULTURAL INTERACTIONS BETWEEN GREEKS AND THE INDIGENOUS POPULATIONS OF SOUTHERN ITALY

Author(s): Fasanella Masci, Marianna (University of Lausanne)

Presentation Format: Oral

The cultural influence that the first Greek colonists had on local (Oenotrian) communities of Sibaritide (Southern Italy) during the Early Iron Age has recently been subject of intense discussion. Scholars interpreted these encounters either as conflictual interactions, or on the contrary, as a more complex and dynamic process. Both theories are based on the transformation of the native population and little is known on the effects these encounters had on the Greeks in the motherland.

Research in the sanctuaries of Euboea (Greece) and its colonies offer a field of reflection about shared ritual practices and the relationship between Greeks and native people in a wider perspective. Like in most of cult places, ceramic artefacts are the most important source of information to understand the ritual acts performed whilst offering access to social practices within communities. For instance, locally produced vessels recently discovered in the site of Francavilla Marittima in the Sibaritide exhibit a hybrid character between Euboean wheel-thrown pottery and local Oenotrian shapes. The production of this so-called "Oenotrian-Euboean" pottery could suggest peaceful contacts with Greeks prior to the foundation of the Greek colony of Sybaris.

In this work, we compare the production and cultic use of hybrid Oenotrian-Euboean pottery from the Sibaritide with the Euboean Geometric pottery from the Sanctuary of Apollo in Eretria (Euboea, Greece). We aim to provide new insights into the acculturation process between Greeks and indigenous people in South Italy. Using digital microscopy, macro traces and X-ray analysis, together with well-established archaeological methodologies, we analyse the types of vessels used in the different contemporary sanctuaries at Eretria and Francavilla Marittima, and we register parallels/mutual exchanges or differences in the ceramic assemblages of cultic use. Furthermore, we characterize technological change, exploring the ways that technology and craft are indices of the social lives of people.

A. EUBOEA IN CORFU? THE CONTRIBUTION OF THE ISLAND'S CULTS AND THEIR ARCHAEOLOGICAL EVIDENCES

Author(s): Aleotti, Nadia (University of Pavia)

Presentation Format: Poster

The topic here presented is part of a wider PhD project on the archaeology of cult in Corfu and its periphery from the 8th to the 4th cent. B.C., aimed to investigate worships attested on the island and in its projection on the mainland, and their archaeological evidences. Among literary sources, Plutarch is the only one attesting an Euboean presence on the island of Corfu before the Corinthian foundation of Kerkyra. The lack of archaeological data of this proto-colonial phase has been connected by some scholars to the nature of the Eretrian presence, very brief during the 8th cent. B.C. and that has never resulted in a real settlement, but, on the other hand, it has been used as the main argument by those who deny any proto-colonial Greek settlement on the island. If the absence of archaeological data directly connected to an Euboean phase before the Corinthian colony is absolutely undeniable, some cults and mythologies attested in Corfu seem to refer to an Euboean origin and they can support the Plutarch's notice about the Euboeans in Corfu. For some of them, as for instance Aristaeus and his daughter Makris, we can clearly follow their persistence and how they have then become part of Corinthian mythological references. For others, especially for some of the main worships of the island shared by both the Euboean and the Corinthian pantheon- as Hera or Apollo-, we can instead only find some Euboean rather than Corinthian aspects of the worship. The aim of the poster is then to collect all these cults and mythological references and their archaeological evidences, in order to better understand their role in the wide debate of the Euboean presence on the island.

FROM LANDSCAPE ARCHAEOLOGY TO SOUNDSCAPE ARCHAEOLOGY: THEMES, APPROACHES, AND PERSPECTIVES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Bellia, Angela (Institute for Archaeological and Monumental Heritage - National Research Council) - Mattioli, Tommaso (Dept. Història i Arqueologia, Facultat de Geografia i Història Universitat de Barcelona)

Format: Regular session

The study of sound in archaeological contexts includes many subject areas that range from music archaeology to physics acoustics. Each of these areas raises a number of challenges concerning the choice of the methodology and the methods to be adopted. A key element in this selection pertains to the physical scale of the analysis of the auditory experience; this can vary from the perception of sounds in a limited area up to interactions within large sonic environments. Although soundscapes have been thoroughly discussed at a theoretical level, this type of analysis has so far been sparsely applied in archaeological research.

Therefore, some of the questions that papers for this session could address are: by putting sound back into an archaeological landscape, would we be able to understand how people lived? Through examination of the sounds heard by people wandering the landscape, would we be able to understand their culture and rituals in more depth? By reading (or re-reading) archaeological landscapes, how could we model an ancient soundscape? How did the study of soundscape in the past help us add a new dimension to our archaeological picture of ancient culture? How does technology enable us to understand the way sounds were experienced in their original location?

These topics will be addressed through contributions of scholars working in various fields: archaeology, acoustic engineering, archaeomusicology, soundscape studies, anthropology, neuropsychology and heritage.

ABSTRACTS

1 COMPARATIVE ARCHAEOACOUSTIC STUDY OF PREHISTORIC ROCK PAINTINGS IN FINLAND

Author(s): Rainio, Riitta - Lassfolk, Kai (University of Helsinki)

Presentation Format: Oral

Since 2013, our archaeoacoustics research project in Finland has explored the acoustic properties of prehistoric Finnish rock paintings, presumable sacred sites of Neolithic hunter-fisher-gatherers. The in situ impulse response measurements and computational signal analyses indicate that the painted lake-shore cliffs reflect sound efficiently generating strong and sharp discrete echoes as well as illusions in which sound appears to emanate from the painted figures. This paper will present the results of the new comparative measurements performed during the field seasons 2018 and 2019. We will use pairwise comparison of spectrum analysis plots to differentiate between the wintertime and summertime acoustics, the acoustics of well-preserved sites and partly destroyed sites, and the acoustics of rock painting sites and random reference points. The new larger body of data provides a more accurate picture of the echoes at Finnish rock paintings, and helps to assess their distinctive acoustical features, elements that distinguish the echoes of the sacred sites from other echoes heard in the lake environment. The paper seeks to establish criteria for "special acoustics" at the sites that feature only one or two echoes and a moderate reverberation time.

2 REDISCOVERING LOST SOUNDS IN ANCIENT SPACES: APPROACHES AND PERSPECTIVES

Author(s): Bellia, Angela (Institute for Archaeological and Monumental Heritage. National Research Council of Italy)

Presentation Format: Oral

As something that does not tend to leave direct material traces, sound is not often considered in archaeological work. However, it was an important aspect of ancient life that can be investigated using a new approach to the archaeological remains. When taking this understanding of sound into account, it seems surprising that important public spaces in antiquity, such as performative spaces, have been investigated almost exclusively with a focus on their visual function as spaces in which individuals or groups display and experience their collective or personal identities and status. Only by acknowledging, investigating, and recognising buildings and performative spaces as embodied spaces and 'sensory artefacts', based on their physical structures and the way sound reacts to those structures, can we begin to understand sound perception in these places of the past and its complex relationship between buildings, spaces and social interactions. This proposal aims to explore the reasons that led ancient cultures to create these spaces, as well as reconstruct how they experienced them by analysing both the physical acoustics and the way these acoustics shape what people perceive.

3 ECHOES FROM THE PRESENT, ECHOES FROM THE PAST: EXPERIENCING ANCIENT SOUNDSCAPES THROUGH ETHNOGRAPHY AND ETHNOHISTORY

Author(s): Weig, Doerte (University of Barcelona) - Jiménez Pasalodos, Raquel (University of Barcelona - University of Valladolid) - Mattioli, Tommaso (University of Barcelona)

Presentation Format: Oral

Phenomenological interpretations of past landscapes have been proposed for at least 25 years, however, very rarely this epistemological approach has taken into account multisensorial experiences other than those embodied by archaeologists themselves. On the other hand, ethnoarchaeology, ethnohistory and direct analogies have also been privileged methods of interpreting ancient cultures but most of them have focused on the concreteness of material culture.

In this paper, developed under the Artsoundscapes ERC project (<https://www.facebook.com/artsoundscapes/>), we propose a combined methodology where the intuitive and empirical knowledge of past soundscapes is revalued in the light of the information given by ethnohistorical and ethnographic sources. We propose to link ethnography and phenomenology to connect multisensorial lifeworlds and soundscapes with modern bodies through technology, and to enhance data gathering in the field. Finally, this proposal discusses how to avoid the cultural evolutionistic implications that often derived from this direct comparison through some case studies about the relationship between indigenous communities from Namibia and Siberia and their soundscapes.

4 THE SOUNDS OF SELECT SACRED LANDSCAPE IN ANCIENT GREECE: OVERVIEW AND PERSPECTIVES

Author(s): Angliker, Erica (University of London, Institute of Classical Studies, Research Associate)

Presentation Format: Oral

Ever since Aristotle, Western societies have considered sight the primary sense. Vision has not only served as the basis of empirical science and the Enlightenment but has also dominated the study of cultural phenomena. In recent decades, this trend has shifted; today sociologists, anthropologists, psychologists and classicists are now aware that societies think differently and that sound is an important aspect of cultural experiences. The lost dimension of sound in ancient societies has been addressed

through the reconstruction of ancient instruments, while new multisensory approaches to ancient ritual take into account space in which music and sound may have played a particularly important role. Aligning with recent research on ancient sound, this paper aims to bring to the forefront the importance of sound in ancient Greek cultic practices. The first part of this paper draws on epigraphic, literary and archaeological data to demonstrate the importance of sound in ancient cultic practice through several case studies. It examines the importance of sound at sites of cult practices in Dodona in Epirus (where a prophetic oak tree that answered agonizing questions by rustling its leaves, and priests made prophecies by de-coding the sounds of bronze cauldrons and the cooing of pigeons) and on Delos (where the mingling of many dialects and different languages constituted a form of homage to Apollo). The importance of sound within cultic space is also relevant to recent studies on caves. The second part of the paper relies on new approaches in sensorial studies to reconsider three ancient sites, the layouts of which seem to indicate a possible use of acoustic devices to enhance the cultic experience: the open-air rock sanctuary at Strophilas (Andros), the dark winding stairwells (so-called labyrinths) in the temple of Apollo at Didyma, and the underground corridor beneath the temple of Apollo on Claros.

5 THE SOUNDSCAPE OF PUBLIC FESTIVALS IN ATHENS

Author(s): Liveri, Angeliki (Independent Researcher)

Presentation Format: Oral

This paper will present the soundscape of public festivals in Athens from the Archaic to the Classical times. Music, songs and other musical performances took place during feasts, mainly religious, celebrated in honor of various deities, such as Athena, Apollo, Dionysus and Hephaestus. Music-making/playing in honor of the gods at procession and sacrifice was very important. These ceremonies accompanied by musical instruments, singing and dancing. Musical contests were also included, mostly at the beginning of the festivals. All citizens of the polis participated active at the celebrations. The traditional feasts followed the time's trends: their "artistic" program was adapted to the time; it became richer included new competitions in musical instruments, dances, songs, or literary genres. One observes a continuity, renewal and expansion of the program. Music was sounded in free spaces (streets or sanctuaries) or also indoors (odeia). The sounds of Auloi, kitharai, and salpinges dominated; lyre, krotala, tympanon and other instruments were also used. The sounds of music, dance (e.g. pyrrhic or ecstatic), songs, recitation and other performances composed a charming, unique soundscape in Athens during the festivities.

The presentation focuses in feasts in honor of the city-patron, the goddess Athena (Panathenaia) and of the god Dionysus (Dionysia en astei). References in written sources will be compared and combined with archaeological finds: representations of musicians, singers, dancers and other artistic performers on vase paintings or reliefs and remains of musical instruments will contribute to reconstruct an image of the soundscape in Athens during these festivals.

6 FOREGROUND SOUNDS AND SOUNDMARKS IN ANCIENT ROMAN ANTHROPOPHONY: QUESTIONING ANCIENT PERCUSSIONS

Author(s): Saura-Ziegelmeier, Arnaud (Université Toulouse II Jean Jaurès)

Presentation Format: Oral

Archaeology and organology studies of Ancient percussion instruments or sound objects help us to better understand and achieve sounds heard by Ancient populations. Faced to literary and iconographic testimonies, archaeological data could assist us to distinguish physical soundscape depictions to ethical and moral considerations, even if both might be linked. In the Ancient Roman soundscape, such drums artefacts seem to play various similar roles: signals intended to the gods and / or humans, protection, healing, votive offerings, etc.

This paper will examine the potential constants (or differences) between percussion instruments by putting them back into the global ancient anthropophony(1) as foreground sounds(2) and soundmarks(3). Effects produced by sistra, cymbala, tympana or crotala are more understandable by contextualizing them into a general archaeological landscape. In this way, we can realize, for instance, that apotropaic and prophylactic aspects come from the material or the movement rather than from the sound itself. In other words, we analyze what a percussion foreground sound means for Ancient individuals. We'll also discuss the importance of percussion instruments as soundmarks for the communities within the global Roman world. Indeed, such objects – even not only because of their sound characteristics – are identities markers, especially of religious or political ones.

(1) All sounds produced by humans inside the soundscape (Krause 2008).

(2) Murray Schaefer 1977.

(3) Within the global soundscape, this sound is unique. Following R. Murray Schaefer, 1977, p. 10 : "once a soundmark has been identified, it deserves to be protected, for soundmarks make the acoustic life of a community unique".

7 HEARING THE LAND: MAPPING THE SOUNDSCAPE IN OTTOMAN CYPRUS

Author(s): Given, Michael (University of Glasgow)

Presentation Format: Oral

Scale is key to understanding the human experience of landscape. Archaeological survey in the Mediterranean and elsewhere has noted concentric zones of varyingly intense activity round settlements, for example. These often include (from the centre): a

community focus such as religious building or public square; a domestic zone; a peripheral zone for activities such as dumping of refuse or threshing grain; the infields; the outfields; and the so-called 'wilderness' or 'wasteland' beyond. These can sometimes be distinguished by the changing character of built structures and by the decreasing density of artefact scatters.

What really characterises these zones in terms of lived experience, and enables communication across and between them, is sound. For historical periods, these can be reconstructed with the help of the archaeological material, oral history and historical documents. Again, from the centre, they might include calls to prayer, noisy families in their courtyards, the rhythms of flail or threshing sledge, the work of the plough team (people, animals, plough), and the communications and daily rhythms of herders, hunters, gatherers and travellers. One key aspect is the elaborately intertwined relationships across the socio-ecological communities made up of humans, animals, plants, soil, water and weather, all of which have their own characteristic sounds.

I will demonstrate these ideas by mapping the concentric sounds of an Ottoman-period settlement lying on the interface of mountain and plain in the Northern Troodos mountains of Cyprus. By listening to the aural symphonies and dissonances that animate these different parts of the landscape, I intend to redraw the connections between places, people, and more-than-human others in our shared world.

8 THE SOUND OF STONES. A STUDY IN A TEMPLE IN THE ARGENTINE ANDES

Author(s): Balbi, Jose (Colchester Archaeological Group; Ministerio de Cultura y Educación, Buenos Aires) - Buffalino, Eduardo (ISFD Instituto Superior de Formación Docente)

Presentation Format: Oral

The aim of this work is to present the discovery of an Inka temple located in the most important city south of the capital of the Empire, Cuzco.

"El Shincal de Quimivil", located in Argentina, was an important Inka administrative and religious center in the Kollasuyu, it was excavated and studied archaeologically from Alberto Rex González in the 60's, who arrived at a part of it, for Rodolfo A. Raffino, from the 70's and many other professionals to this day.

One of the structures, Complex 19, was mistakenly considered a military fortress until the completion of a series of archaeological works between 2015 and 2018, before which it was called "El Atalaya" (The Watchtower).

The reason that the military function was discarded and considered a temple, was determined with the first excavations, in which was found a ceremonial furnace, several libaderos, and a central rock with a series of channels and tubes excavated by hand, whose filling with water would end up indicating some kind of religious ceremony and even some rite of divination.

It is known the existence of a series of Andean musical instruments, especially made of ceramics, which produce sounds with the placement of liquids, or the simple blowing. Our work begins with the study of these instruments and the attempt to produce sounds on this stone structure carved in a rock of the American Andes in one of the sacred cities of a culture that considered the sounds produced by the instruments as part of their rites and customs.

Our work is experimental, and as novel as archeology musicology itself. We will expose the applied methodology and the development of new techniques to determine if these structures produced sounds that modern man has not yet heard.

9 CALIFORNIAN "ROCK MUSIC": ANCIENT SOUNDSCAPES FROM A TRANSNATIONAL AND MULTIDISCIPLINARY PERSPECTIVE

Author(s): Picas, Mathieu (University of Barcelona / Artsoundscapes ERC Project) - Alarcón Jiménez, Ana María (Independent Researcher) - Coltofean, Laura (University of Barcelona / Artsoundscapes ERC Project)

Presentation Format: Oral

Our knowledge about the rock art of California is mainly concerned with the visual nature of the panels depicted in caves and shelters of both Mexico and the USA. Senses other than vision are largely ignored, even if anthropologists indicated that music and songs have been systematically present in ritual. Recent studies have also demonstrated that many rock art sites around the world are indeed located in places with special acoustics. In short, the literature pertaining to the new field of archaeo-acoustics strongly suggests that rock art landscapes were not perceived as "dead silent" by their creators. What about ancient Californian soundscapes? Is there any possibility that rock art and ideas on sound and/or music were related in this specific region? This paper is the result of a research that is being undertaken in the Artsoundscapes ERC project and it aims to provide new perspectives on the understanding of the Californian past through a multidisciplinary perspective. The study of sources from missionaries and more recent ethnographers will allow us to inquire into the place given to sound and/or music in ancient Californian societies, especially in a ceremonial context. Also, we will establish a list of pre-Hispanic musical instruments from sources such as chronicles and archaeological reports and collections. Finally, we will reflect on the similarities and differences in the field of ancient soundscape studies between both Californias whose border is a recent invention in spite of their prehistoric cultural similarities.

10 CERAMIC RATTLES AS ULTRASOUND TOOLS USED IN MEDIAEVAL POLAND

Author(s): Gruszczynska-Ziółkowska, Ewa (Institute of Musicology University of Warsaw)

Presentation Format: Oral

The study of sound space is a well-known problem for both anthropologists and musicologists. The human being participates

actively in its formation, complementing with the sounds produced by himself the environmental acoustic background.

But: how can we approach the intention of, for example, a maker of a musical instrument which has been found in archaeological excavations? This question is particularly important in the case debated in the present text: the presence in the archaeological records of instruments, whose sounds exceed the limits of reception of the human ear. In this precise case, it is a set of ceramic rattles from the medieval period, found, among others, in funerary contexts in the territory of present-day Poland. The acoustic analysis of this set of objects revealed, that apart from a quite weak sound audible for humans, they present a strong signal in the frequencies between 17 and 22 kHz. Is this an intentional effect on the part of the craftsman, or a purely fortuitous effect? It seems, that the first option is the correct one: an attempt to extend the sound landscape and to cross the horizons of sensory experiences.

11 RINGING ROCKS AND SINGING SAND DUNES: A SURVEY OF INTERCONNECTED SONIC LANDSCAPES IN NORTH AMERICA'S GREAT BASIN

Author(s): Liwosz, Chester (Independent Scholar)

Presentation Format: Oral

Worldwide rock art research has more often than not reinforced connections between the occurrence of parietal art and places with novel echo properties. In western North America – as seems to be the case in other regions – oral traditions describe this link between sound and visual culture in terms of landscape animacy. In the Great Basin, aboriginal traditions describe many landscapes both with and without rock art as supernaturally endowed with voice. From ringing rocks in piñon forests, to resonating box canyons, to singing sand dunes, these sonorous landscapes are tied together by a web of cultural connections. This paper combines new and previous research to discuss the traditional links between these places in terms of Native American narratives, indigenous ideology, archaeological evidence, and economic interactions in the Precolonial past. This project's digital approach reanimates abandoned landscapes, building immersive virtual tours of ancient, interconnected soundscapes. Analytically, this integration of 3D models with field-tested sound profiles provides a creative tool useful for inspiring continued innovation in research design, theories, and practice. This study of the sociality of soundscapes weaves together theory and virtual environments, asking "what roles did they play in daily life?" and "how did they mediate ritualized aboriginal political economies?"

185 POWER AND SATISFACTION OF NEEDS IN CENTRES OF POWER

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Theune, Claudia (University of Vienna, Dep. Prehistory and Historical Archaeology) - Atzbach, Rainer (Aarhus University, School of Culture and Society)

Format: Regular session

Profane centres of power (castles, cities and other places of reign) form striking signs in a landscape. Their elements, forms and functions are often the subject of archaeological and historical investigations concerning the topography of power. The objects found at these sites however played a subordinate role in terms of their significance in the specific landscape and the associated network of power. In the first instance this applies to the communication of power, but also for economic aspects such as the satisfaction of needs. These are subject to diverging social, economic or ecological requirements of varying degree and intensity. The satisfaction of needs forms the basis for social action. Possible questions that can be discussed during the session relate to spatial aspects ("where"), which actors are involved ("who?") and why specific artefacts occur in an environment ("why?")? Possible contributions can focus on research questions at the micro level (the individual and social groups in the seat of power) and at the macro level (location, transport, economy, organization, etc.). How is the site of power integrated into the surrounding area and what influence does the surrounding area exert (keywords: traffic situation, economic and ecological conditions, range of influence, rank of the ruler)? In addition to the comprehensive analysis of artefacts and object groups, spatial analyses (viewsheds and network analysis), the application of methods from landscape archaeology, architectural analyses and the comparison to written and image sources are of great interest for this session. We kindly invite you to submit proposals that introduce these or similar theory-based analyses.

ABSTRACTS

1 CENTRES OF POWER AND THE EMERGING MEDIEVAL ELITES IN THE EAST-CENTRAL EUROPE. THE CASE STUDY: POHANSKO NEAR BŘECLAV

Author(s): Machacek, Jiri (Masaryk University, Brno)

Presentation Format: Oral

Centres of power have often been mentioned in association with emergence of early medieval aristocracy. Archaeology can identify in such places various types of separate burials or residences of elites. Such structures count among the most distinct displays of the so-called nobilitation.

According to results of archaeological research, the process leading to emergence of medieval aristocracy and their property began in central parts of the Frankish Empire in the Merovingian Period. From this civilisation core it has gradually spread out to

all directions, among others also to the East-Central Europe. It signified the beginning of a great change, which we call “medieval transformation” (according to J. Klápště). Among significant European sites, which are important to understand the medieval transformation, is Pohansko near Břeclav. The newest discoveries at Pohansko and in its neighbourhood in the past decade brought crucial information about the topography of power and to the satisfaction of needs of local elites. Based on current research, we suppose that here – in the north-eastern suburb (outside the ducal castle) – we found evidence of existence of one of the oldest noble families in East-Central Europe – its proprietary church and the residence (curtis). Archaeological research in the north-eastern suburb has been carried out in 2007-2018. This excavation unearthed the foundations of a still unknown Great Moravian church (rotunda), a church cemetery and a part of the adjacent settlement. Within the area, we identified remains of a palisade enclosure, above ground and multi-space houses, workshop buildings, large ovens – probably from the bakery, sunken-floored dwellings with an exceptional set of iron tools, which have belonged to the inventory of the curtis, and most importantly a surface residential dwelling with walled corner. Systematic research was carried out simultaneously in wider surroundings of Pohansko – inside its agrarian hinterland of the centre.

2 STRATEGIES OF FULFILMENT OF NEEDS IN NOBLE MANORS AT ALPINE CROSSINGS FROM THE LATE MIDDLE AGES TO THE 20TH CENTURY

Author(s): Winkelbauer, Iris (University of Vienna)

Presentation Format: Oral

The main topic of the oral contribution is going to deal with different strategies of satisfaction of needs in manors of nobility at alpine crossings based on the interpretation of material remains (mobile and immobile objects – finds, features and built structures). A theoretical model should be introduced with the objective of answering questions of “How, why and whereby could needs be satisfied?”, “Who was able to satisfy these needs?” and “Which dynamic processes of change in a synchronic and diachronic dimension could be identified?” The model is based on concepts of the Chilean economist Max-Neef and the German psychologist Heckhausen. Max-Neef understands needs as universal and limited in each society. Only the satisfiers of needs change. A differentiation of luxury and needs is reversed and a connection between material and immaterial aspects in the shape of satisfiers of needs can be ensured. Satisfiers of needs are gained on a micro-, meso- and macro level and they are subject to a permanent and dynamic influence. Water, for example, is not understood as a need, but merely functions as a satisfier of the need for subsistence. Due to a synchronic comparison of different satisfiers of needs (e.g. a simple wooden cup or a lavishly designed pruned beaker, which serve to receive liquid), the circumstances (terminology according to Kraus) of various residents of a noble manor can be grasped. A diachronic comparison captures an altered situation of the inhabitants due to a different weighting of the material and immaterial aspects of a satisfier of needs. The Austrian castle of Hanfelden in Styria will function as case study. It is located at a narrow point of the “Pölstal” valley, a junction from which not only the “Triebener Tauern” and “Judenburg” but also “Oberzeiring” with its important silver mining could be reached.

3 PLAY & POWER: CASTLES AS PLAYGROUNDS IN THE MEDIEVAL PERIOD AND BEYOND

Author(s): Hall, Mark (Perth Museum)

Presentation Format: Oral

This presentation will explore a key aspect of the satisfaction of needs within centres of power: play, specifically within and around castles. Using a suite of examples from across Europe - including Eilean Donan, Dundonald and Sween (all Scotland), Castle Acre and Gloucester (England), Mayenne (France), Alcoutim (Portugal), Castello di Arco (Italy), Malbork (Poland) and Hilversum (Netherlands) – along with sources such as paintings and written accounts (including the fantastical) some of the rich seam of evidence for board and dice games in particular will be assessed. Exploring these several strands of evidence for play allows us to see how the very idea of the castle could be playful and contribute to its rich symbolism as lordly residence and dominant node within landscapes and networks of power. This fusion of imagination and material culture persists in the on-going use of many castle ruins as playgrounds long after their political power has ebbed away.

4 DID SIGNAL FIRES EXIST ON LITHUANIAN HILLFORTS? FROM A MEDIEVAL CHRONICLE TO VIEWSHED ANALYSIS

Author(s): Kurila, Laurynas (Lithuanian Institute of History)

Presentation Format: Oral

Military communication by fire and smoke signals was a common practice for several millennia around the world. It was best developed in those places with favourable relief, a society able to muster large military forces as well as human and material resources, and exposure to a long-term, continuous threat by outside enemies. The main element of the Iron Age (500 BC – AD 1200) and medieval Lithuanian defensive systems was wooden castles on hillforts. A stereotype of castles linked by fires is established in the literature, particularly that on period of the Northern Crusades and wars between the Teutonic Order and the Grand Duchy of Lithuania (13th–early 15th c.). This image, however, has been confirmed by only a single mention by Peter of Dusburg of 1317 attack on Junigeda Castle.

The author attempts, on the basis of viewshed analysis, to discuss what possibilities existed for visual communications between Lithuanian hillforts, how much this was determined by the relief, and what additional resources were likely required for this. Three sample regions were selected: the banks of the Nemunas River and Samogitia during the Crusades and, for comparison,

Southeast Lithuania during the Migration period (mid-1st c. AD). It is argued that in the first region, linear links could have operated effectively and in the second, a lattice-shaped visual communications system is plausible. But in the third, visual signalling between the hillforts could have hardly been effective. These differences should be associated with both the relief of these regions as well as different defensive needs. In the first two cases the castle systems functioned over a long period in the presence of constant military threat posed by the Order while the unexpected attacks by wandering marauders in the third did not lead Baltic chiefdoms to the formation of an early warning system.

5 LORDSHIP AND RUBBISH – ARCHAEOLOGICAL APPROACHES TO UPPER STATUS LIVING STYLE ON CASTLES

Author(s): Atzbach, Rainer (School for Culture and Society, Aarhus University)

Presentation Format: Oral

This paper seeks to explore the material background of medieval elite living on castles. Since Frauke Stein's study about "Adelsgräber" (1962) a vivid discussion has tried to identify characteristic objects being significant for the upper class in medieval society. Krauskopf (2006) and Goßler (2008, 2015) classified archaeological findings from castles as being "ordinary", "superior" or "outstanding" equipment, which contained "barometer objects" signaling a certain status in society.

More recent research has revealed that the range and variety of objects provides an additional signal for an upper class standard and style of living. This traditional view of wealth visible in refined or valuable objects can be challenged using Rathjes (1992) concept of "garbology", which opens for a radical review of archaeological findings and their interpretation. This competing theoretical approaches will be used for answering the subsequent questions:

- In how far is it possible to identify objects associated with the users of a castle?
- In how far is it possible to conclude from archaeological finds to their former owners' status?
- What is the relationship between a castle and its hinterland in terms of demand and supply?

6 ZOOARCHAEOLOGICAL MATERIAL FROM VILNIUS CASTLE – INDICATOR OF THE EXCEPTIONAL RECOURCES AND POWER

Author(s): Blaževicius, Povilas (National museum Palace of the Grande Dukes of Lithuania; Association of Lithuanian Archaeology) - Piličiauskienė, Giedre (Vilnius University)

Presentation Format: Oral

An impressive collection of archaeological artefacts and ecofacts were unearthed during the thirty years of intense archaeological excavations in Vilnius Castle complex (Lithuania). Up to 70 000 mammal and bird bones and their fragments represent a period of more than 700 years. During the period between the end of 13th– 17th century's, the castle complex and the Royal palace in it, were populated by the nobility of the Grand Duchy of Lithuania. It means that zooarchaeological material could be interpreted as an objective indicator of concentration of the recourses and power.

In our paper we seek to explore and to compare zooarchaeological material from the Vilnius castle complex (which represents nobility strata) with the analogical data from Vilnius city. As the most obvious reflection of the differences in the socio-economic capacity of consumers, as well as the unrestricted access to exclusive resources, we decided to investigate the zooarchaeological material related to hunting – remains of wild mammals and birds, dogs and birds of prey.

The results of the research suggest that abundance of large wild animal bones (such as auroch, bison, elk, deer and wild board), numerous remains of greyhounds and molosser type dogs as well as birds of prey (golden eagle, peregrine falcon, goshawk etc.), witnesses that Vilnius Castle complex was an extraordinary centre of power.

7 SETTLEMENT PATTERN AND LAND USE UNDER THE FRANKISH FEUDAL SYSTEM IN NW PELOPONNESE, GREECE (13TH-MID 15TH C.)

Author(s): Simoni, Eleni (University of Patras) - Papagiannopoulos, Konstantinos (Institute of Local History) - Kontolaimos, Panagiotis (Independent Researcher)

Presentation Format: Oral

Following the conquest of Constantinople during the 4th crusade in 1204, Latin hegemony was established in major parts of the dissolved Byzantine Empire. The principality of Achaea was one of the Frankish states that was founded in this period. It engulfed the Peloponnesian peninsula, in southern Greece, and it was divided into twelve secular baronies, which were subdivided in fiefs, run by knights. A strict hierarchy consisting of the prince, the barons, and the fief-knights enabled a feudal system quickly to develop and be imposed on the locals.

The erection of a castle as central landmark of each fief is known from literary sources and archaeological research. Beyond the castles lay series of villages and small rural sites, strongly connected to the activities of the fiefs and often relocated, in order to better serve the new masters. Nowadays, one comes across evidence that ranges from standing structures to scattered debris and pottery in the fields. Literary sources offer additional information about sites that haven't been discovered yet.

Fieldwork which has taken place in northwestern Peloponnes, within the confines of the barony of Patras, has focused on identifying the implementation of the feudal system at the scale of a fief. Data are drawn from surface survey, and from historical records such as Frankish estate documents, the Chronicle of the Morea, and Ottoman tax registers. Spatial analysis in GIS is

used to examine the role of the castles to the economic and social life of the subordinate settlements and how the exercise of power is materialized in the landscape.

8 THE LONG-FORGOTTEN OPPIDUM OF ROGGWIL, FRYBURG (CANTON OF BERN, SWITZERLAND) – A LATE LA TÈNE CENTRE OF POWER

Author(s): Lanzicher, Andrea (Archäologischer Dienst des Kantons Bern)

Presentation Format: Oral

In 2008 the oppidum of Roggwil, Fryburg became the focus of archaeological research. The discovery of 7157 fragments of coin pellet moulds made it clear that the site was an important Late La Tène settlement. The Archaeological Service of the Canton of Bern is currently studying the output of a 10-year-long survey.

For thousands of years, the central Swiss plateau between Lake Biel in the west and the important river confluence near Windisch/Vindonissa in the east has been a transit and trade axis. In the Late La Tène period, five central settlements lined up along the navigable Aare at regular intervals of 20 km. These settlements include Roggwil, which, since its discovery, has filled a gap in the eastern Helvetic settlement area – a territory Caesar described as hierarchically structured.

The fortified settlement area contains abundant building remains. So far, however, it is the finds that shed the most light on its former function. Coin pellet moulds and several coin blanks and planchets indicate an intensive coin production. Thus, Roggwil played a central role in the monetary economic cycle supplying its surroundings. This role can only be explained by the (direct or indirect) presence of a strong authority.

Roggwil was also a metal-processing centre. Among thousands of finds, there are numerous yoke top pieces and middle pins of guiding rings. Several middle pins have been identified as casting waste. Together with off-casts of drinking horn end pieces and hundreds of unspecific casting wastes and workpieces, they prove an important local artisanry. The finished yoke components usually had enamelled heads. It can only be assumed that specialist craftsmen carried out this processing. The examples demonstrate the role central settlements played in providing specialized (metal) goods to surrounding areas to satisfy the needs of their populations.

9 FEMALE DRESS AND LOCAL CENTERS OF POWER OF THE ANCIENT AESTIANS (SAMBIAN-NATANGIAN CULTURE) IN THE BEGINNING OF THE ROMAN PERIOD

Author(s): Khomiakova, Olga (Institute of Archaeology of RAS, Moscow)

Presentation Format: Oral

The archaeological cultures of South-East Baltic, associated with the West Balt Circle (so-called Aestii) in Roman period considered to be a part of the trans-baltic intercultural exchange system, connected with centers of power in Northern Europe and the Southern coastland of the Baltic Sea.

The Sambian-Natangian culture (Kaliningrad region of the Russian Federation) takes a centerpiece in the West Balt circle. It's special conditions: access to the sea, the presence of the richest amber deposits, – determined the possibility of cultural relations with the Roman Empire, Central and Northern Europe. A significant economical and cultural center, which played a key role in “amber trade” and interposition in spread of all kinds of innovations in the Eastern Baltic, arised here in Roman period.

Traditionally the investigations of the Sambian-Natangian's antiquities are based on the studyes of burial rite. Issues of the emergence of regional elites and local centers of power are also draw on the grave's data. Along with the traditional methods, the methods of correlation, cluster and GIS-analysis can be used.

The lecture presents a comparative analysis of the results of allocation of local centers of power using spatial analysis of cemeteries of the Sambian-Natangian culture, and their comparison with female graves data. In the beginning of the Roman period a group of female graves, which indicates the presence of “higher” groups in Aestian society, can be distinguished. Female dress is also regarded as one of the possible reflections of social structure. It can shed more light on a number of existing questions. How did the Aestians form the earliest local centers of power in the Roman period? What was the nature of social structures in the South-East Baltic? Who were they connected with? And finnaly, what place could they occupy in the social pattern of the Baltic region?

10 THE THRACIAN INFLUENCES ON THE ARCHITECTURE OF ANCIENT BOSPORUS (THE STUDY OF A NEW MONUMENT OF FUNERARY ARCHITECTURE)

Author(s): Rukavishnikova, Irina (Institute of Archaeology Russian Academy of Sciences) - Beylin, Denis - Fedoseev, Nikolay (Institute of Archaeology of Crimea Russian Academy of Sciences)

Presentation Format: Oral

The unique monument of ancient funerary architecture of the elite Bosporian society was discovered. Hospital mound - the largest in the chain of mounds, departing from the Yuz-Obinsky ridge. The monument included a monumental crypt with a rectangular camera in plan with a stepped ceiling and a long dromos with a portal decorated in the form of stairs, covered with two-layer plaster. The whole complex of structures and numerous vessels from the treyzn belong to the second half of the 4th century. BC.

The funeral structure (crypt) occupies a central position in a mound. The construction itself consists of two parts: a chamber and a dromos. A correctly constructed, retractable arch with a small (up to 7) number of rows, withstands “itself” without additional

pillars. Most of the famous concessive crypts have about four to six ledges, so they are usually built on the mainland.

Among them are Tsarsky, Golden, Melek-Chesmensky, some crypts of the necropolis of Hughes-Oba, ect. Such buildings are common for 4th century BC Bospor's funerary architecture. The shape of the burial chamber can be divided into two types: quadrangular and round.

The largest crypts are the earliest. They have a four-sided overlap. The overlap on three sides is known only in two cases.

The sharp barrow had a stone crepe in the form of an octagon; this has not been recorded on any other Bosporan burial mound. From its three sides (western, eastern and southern) unusual structures in the form of large stone staircases were included in the structure of the crepida. Crepids, are revealed in some Thracian mounds.

This innovation was associated with the strengthening of the Thracian influence on the Bosporus, and establishment the Spartokid dynasty. Nowadays, this innovation is attributed approximately to the turn of the 5th-4th centuries BC.

11 LEGAL STATUS AND MANIFESTATION OF POWER: THE ROMAN CUSTOMS POST TURICUM (ZÜRICH)

Author(s): Wyss Schildknecht, Annina (University of Berne, Institut für Archäologische Wissenschaften; Augusta Raurica)

Presentation Format: Oral

The Roman Small Town Turicum/Zürich is an epigraphically attested customs station of the Gallic customs district (quadragesima galliarum) – a legal status that is very rarely found for Roman settlements. If the other known Roman customs posts are taken into account, the decisive factors for the appointment of a customs station become clear, which do not merely seem to be determined by its size, infrastructure or specific archaeological finds.

Looking at Turicum the attainment of this legal status was undoubtedly the logical consequence of its favourable location in terms of transport links as well as its emergence from a Celtic oppidum. Therefore, Turicum, in addition to its central function for the immediate surrounding area, had demonstrably supra-regional significance. While the regional impact can primarily be traced back to the regional settlement structure, individual finds show its inter-provincial network. A network that goes beyond trade visits and exchange of goods but requires deeper cultural exchange.

The presentation aims to discuss the legal power of a Roman Small Town and its manifestation in archaeological evidence and the surrounding settlement landscape. However the question remains if legal status and power are connected in ways that are traceable archaeologically?

12 BUILDING A CENTRE OF POWER: POLITICAL TRANSFORMATION OF TEOTIHUACAN, MEXICO

Author(s): Torras Freixa, Maria (Independent researcher)

Presentation Format: Oral

Ancient cities offer a research framework for understanding different power strategies which coexist to some degree in a same society. Thus, through architectural analyses, this paper explores the political transformation of Teotihuacan, Mexico, from the period 1-250 CE. This Mesoamerican urban settlement reached c. 125,000 inhabitants around 250 CE and had a multi-ethnic population and a corporate society. Studying its political transformation can provide valuable insights into economic and social aspects such as the satisfaction of needs. During this time range, changes in Teotihuacan architecture display the emergence of a corporate power strategy. This fact is related to a higher standardization of construction materials, building techniques and orientations, and to a new form of urban residence. In addition, city's growth intentionally destroyed agricultural soils for urban purposes. However, a new food supply system was successful, since Teotihuacan continued to grow until 550 CE. In sum, the purpose of this paper is to discuss the political transformation of the city and how affected its hinterland.

191 FROM SCIENCE TO HISTORY: INTERPRETING ARCHAEOMETALLURGY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Saage, Ragnar (Department of Archaeology, University of Tartu) - Wärländer, Sebastian (Cotsen Institute of Archaeology, UCLA/Getty Conservation Programme; Division of Biophysics, Stockholm University) - Neiß, Michael (Department of Archaeology and Ancient History, Uppsala University) - Jouttijärvi, Arne (Heimdal-archaeometry)

Format: Regular session

Archaeometallurgy is a multidisciplinary field populated by researchers with varying biographies. Some archaeometallurgists have their background in science or engineering, and focus on scientific analysis of metallurgical samples. Others prefer an experimental approach, trying to reconstruct ancient techniques and technologies through practical work. And some archaeometallurgists have a background in the humanities or social sciences, trying to understand metal objects and metal-working from a theoretical or cultural history point of view, or to fit them into historical narratives. Although many agree that a multidisciplinary approach would be ideal, we do not always find practical ways to combine our different approaches. A major obstacle seems to be the lack of a forum for different types of archaeometallurgists to exchange ideas, to develop overreaching research strategies and to develop a common 'language'.

In this session we welcome papers on ancient metalworking in a very broad sense. We particularly appreciate contributions that address questions or provide examples on how to integrate different research traditions, that show how the same material can be studied from different angles. In addition, we would like to discuss the difficulties that may arise when archaeometallurgists

with different backgrounds try to bridge the interdisciplinary gap.

ABSTRACTS

- 1** **ARCHAOMETALLURGICAL CONTRIBUTION TO THE SUPRA-REGIONAL NETWORKS IN THE EARLY AND MIDDLE COPPER AGE IN WESTERN HUNGARY**

Author(s): Siklósi, Zsuzsanna (Institute of Archaeological Sciences, Eötvös Loránd University) - Villa, Igor (Institute of Geology, Bern University) - Mozgai, Viktória - Bajnóczi, Bernadett (Institute for Geological and Geochemical Research, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences) - Virág, Zsuzsanna (Budapest History Museum)

Presentation Format: Oral

Our project studies the spread of the products and technology of copper metallurgy in the Carpathian Basin. The current presentation discusses the first results on the provenance of copper artefacts from Western Hungary in the Early-Middle Copper Age (4350-3800 BCE). This was the earliest period from which traces of local metallurgy was found in Hungary, in a territory laying far from raw material sources. Our multidisciplinary research team integrates various methodology (lead isotope and trace element analysis, Bayesian modelled AMS dating, and network analysis) to reveal the spread of the products and the technological knowledge of copper metallurgy. This case study shows results from two sites (Zalavár-Basasziget and Zalavár-Mekenye) which are located very close to each other and represent two consecutive periods in the Early and Middle Copper Age. A unique copper disc and flat axes were found in the earlier, Zalavár-Basasziget settlement and small copper ornaments and a crucible were revealed in the later, Zalavár-Mekenye settlement. The first few data indicate that the raw material sources used in the two periods did not change. This requires a new interpretation of the process of knowledge transmission. The project is financed from the NRD Fund (NKFI FK no. 124260).

- 2** **SHIFTING NETWORKS AND MIXING METALS IN THE EARLY DANISH BRONZE AGE: THE ARCHAEOLOGICAL AND CHEMICAL EVIDENCE OF METAL TRADE**

Author(s): Noergaard, Heide - Vandkilde, Helle (Aarhus University, Dep. Culture and Society) - Pernicka, Ernst (Curt-Engelhorn-Zentrum für Archaeometrie, Mannheim)

Presentation Format: Oral

As early as 2100 BCE, societies in the hotspot zone of Denmark and Scania began to use metal. However, this region did not exploit their own metal ores; therefore, the origin of the metal used is of key significance to understanding and modelling the cross-European interconnectivities that were established through trade.

For the very first time, the Nordic region was fully dependent on one crucial exogenous resource. However, little is known about the significance, the extent and the direction of the metal trade that kick-started the Bronze Age. Two possible transport routes along which the metal moved to Bronze Age Scandinavia are intensively discussed. A continental route that connected the Alps, Central Europe and the NBA can be juxtaposed with a maritime route linking Mediterranean civilisations with Atlantic communities in Northwest Europe. The archaeological and chemical evidence which support these routes cover mainly the time period from 1600BC onwards. Before 1600BC the archaeological evidence points towards northwest and southeast Europe.

An extensive study of south Scandinavian metal artefacts between 2100-1600 BC via lead and tin-isotope analyses has uncovered the direction and extent for the earliest metal transport routes and trading networks. The chemical fingerprint combined with the archaeological evidence highlights the significance of the metal trade for the earliest NBA societies in the North. As the data consists of around 550 samples evenly distributed over the first 600 years of the period in which the Nordic Bronze Age emerges, a reconstruction of the actual networks is realistic. Secondly, the comprehensive approach investigating the stylistic characteristics of the artefacts, trace elemental compositions and lead isotope data source critically allows us to trace not just the probable provenance of the artefacts but also identifies the mixing of ingot-like artefacts at the edge of the metal using societies for the first time.

- 3** **WERE BRONZE AGE METALWORKERS SKILLED? PERSPECTIVES FROM THE STUDY OF THE MAKING OF BRONZE AGE SWORDS**

Author(s): Dumont, Léonard (Ghent University; Université de Bourgogne, UMR 6298 ARTEHIS)

Presentation Format: Oral

Beyond the provocation of the title, the question of ancient metalworkers' skills, that has been recently discussed by Maikel Kuijpers for Bronze Age axes, makes perfect sense concerning Bronze Age swords, especially when equipped with a metallic hilt. These weapons are indeed almost always described as masterpieces of metalwork made by skilled and specialized craftsmen. This does not take into account the breakthroughs made since the 1960s in the study of the fabrication techniques of bronze artefacts. Even if it is true that most Bronze Age swords are looking flawless on the surface, imaging techniques such as X-ray or CT-scan enable archaeologists to have a glimpse of the inside of the objects, showing that defects commonly occur at different steps of the chaîne opératoire. The quality of the final product can vary a lot from an object to another, but also according to the considered periods or regions. Our aim in this presentation is to use archaeometallurgy to discuss the abilities of Bronze Age metalworkers to produce fully functional swords, but also to fulfill the expectations of their users, which will lead us to question

the purposes of Bronze Age swords.

4 COOPERATION IN ARCHAEOMETALLURGY: THE CASE OF THE LATE BRONZE AGE MINING SITE OF PRIGGLITZ-GASTEIL (AUSTRIA)

Author(s): Mödlinger, Marianne (IRAMAT-CRP2A Université Bordeaux Montaigne) - Trebsche, Peter (Universität Innsbruck)

Presentation Format: Oral

The late Urnfield period (c. 1000-900 BC) mining site of Prigglitz-Gasteil is the largest copper production site at the eastern end of the Greywacke zone (north-eastern Alps). Excavations are ongoing since 2010, revealing the full chaîne opératoire of metal production on-site. In the frame of an FWF-Project, the site is comprehensively studied: slag analyses, metallographic analyses, lead isotope analyses and chemical analyses characterise the remnants of the different production steps from the ore to the final metal object. The site itself is studied by means of radiocarbon analyses, archaeobotanic analyses, charcoal identification, geochemical analyses, geoelectric analyses and core drillings in order to provide a holistic picture of life and work at the mining site and to provide information about the extended chaîne opératoire of metal production, as food and fuel supply, organisation of mining activities and mining venture. Hence, this project acts as an example of a perfectly working cooperation of experts with different background all working in the field of archaeometallurgy.

Acknowledgements: The presented research is funded by the Austrian Science Fund (FWF): [P30289-G25].

5 PERCEPTIVE CATEGORIES AND THE CHAÎNE OPÉRAIRE: TOOLS TO BRIDGE THE GAP BETWEEN ARCHAEOMETALLURGY AND THE CRAFT OF METALWORKING

Author(s): Kuijpers, Maikel (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

There are two distinct frameworks in which prehistoric metallurgy is studied: a material framework and a social framework. The former is universal, the latter contextual. Typically, these frameworks have little to no overlap in terms of methodologies, focus, and understandings. In this paper I propose a third framework: the psychophysical framework. This framework takes into account prehistoric skill, cognition, and the senses.

I will introduce the methodology of perceptive categories through which an empirical analysis of skill is achievable, taking European Bronze Age metalworking as a case study. Based on scientific data provided by the material sciences, in this case compositional and metallographic analyses of Late Copper Age and Early Bronze Age axes, the thresholds to categorise and interpret these data, and organise them in a chaîne opératoire, are centred on the human senses—and thus on metalworking as a craft. This is a pragmatic approach that appreciates scientific measurements of metal objects as essential empirical evidence whilst recognising that a considerable share of these archaeometric data are inapt or too detailed for an understanding of skill. After all, the qualities and behaviour of a material are a sensorial reading of the properties from which they stem. These two knowledge identities must be compatible with each other; they only make use of a different type of categorisation. Science and craftspeople are not describing different realities; they are simply describing reality differently.

6 A LATE BRONZE AGE METAL WORKSHOP FROM THE TELEAC HILLFORT IN TRANSYLVANIA - PRELIMINARY RESULTS

Author(s): Nessel, Bianka (Johannes-Gutenberg-University Mainz) - Uhnér, Claes (Romano-Germanic-Commission) - Ciugudean, Horia - Balan, Gabriel - Timofte, Raluca (Muzeul Unirii Alba Iulia) - Hansen, Svend (German Archaeological Institute)

Presentation Format: Oral

Recent excavations and geophysical surveys at the Late Bronze and Early Iron Age Teleac hillfort, jud. Alba in Transylvania found a large specialised area for high temperature production activities in the northern part of the settlement. The area had the remains of several fire installations of various types, including a well-preserved updraft kiln for pottery production, as well as a building adjacent to the fortification system with several ovens and hearths, burned soil, charcoal and ashes. The building also contained slag and technical ceramics used for metal casting, which indicate that it was a metal workshop. Comparable finds of production areas in settlements from this period are very rare in south-eastern Europe and not much is known about the structure and organization of production activities. We will investigate what materials were worked in this workshop and how important it was for the economy of the settlement using archaeological, geophysical and archaeometallurgical methods.

7 ARCHERS, ANTIOCHOS AND THE CURIOUS CASE OF THE BE ARROWHEADS

Author(s): Mazis, Matasha (University of Kaiserslautern) - Wright, Nicholas (University of Sydney)

Presentation Format: Oral

Bronze arrowheads with distinctive barbs, a tang, and a nodule at the base of the head were distributed widely throughout the Mediterranean and Near East, including the Greek mainland and Aegean, northern Africa, western Asia, and the Levant. Some of the arrowheads were stamped with a monogram BE. The type was prevalent in the Hellenistic period and is said to be closely linked with Crete, famous in ancient literature for its mercenary fighters and archers. This is a tantalizing scenario for those who would correlate the wide distribution of the arrowhead type with the diverse deployment of ethnic Cretan mercenaries. However, by considering new sources of securely provenanced finds from the Levant, iconographic and archaeological evidence, as well as X-ray fluorescence analysis (XRF) of some of the bronze arrowheads, we found new insights into the challenges of logistics

and performance of military service in the late Hellenistic period, including the cohesion of auxiliary fighters and the physical production and supply of weapons. In particular, we think the stamped arrowhead should be associated with a body of archers involved in the campaigns of the Seleukid king Antiochos VII (138–129 BCE).

8 IRON IN CILICIA - ARCHAEOMETALLURGICAL ANALYSIS OF THE IRON AGE IRON OBJECTS FROM SIRKELI HÖYÜK, TURKEY

Author(s): Graber-Pesonen, Joëlle (Bern University)

Presentation Format: Oral

“Iron is one of the most important commodities in the world. The development of technologies for processing of iron is even considered as one of the most important steps in the history of mankind. The beginnings of this technology can be found in the Near East but still are a topic of controversial discussions; crucial questions e. g. about the social and technological circumstances could not be answered conclusively yet. This desideratum is due to the circumstances of especially poor preservation of iron objects, which made it difficult to carry out archaeometallurgical studies. However, refined possibilities enable better scientific analysis.

Due to a rather famous letter (KBo I.14) Kizzuwatna, the ancient region of Cilicia, Turkey, was regarded as the earliest production area of utilitarian iron even before the beginning of the Iron Age, a theory that is believed not without controversy today.

Aim of the thesis is a detailed study on the development of early iron metallurgy in Cilicia based on archaeological and philological methods supplemented by scientific analysis of the artifacts. The objective is to analyze the factors of production and economy for both the cause and the impact of the adaption of iron technology on the one hand and the social conditions and consequences of this technological change on the other hand.

In this paper, the results of the analytical research conducted on objects from Sirkeli Höyük will be discussed. By the use of analytical methods like pXRF, XRD, SEM-EDS and optical microscopy it is possible to gain more information about the manufacturing techniques as well as the possible provenience of the mostly rusty bits and pieces of iron.

9 GOLDEN NETWORKS - AN INTERDISCIPLINARY APPROACH TO IDENTIFY PRODUCER AND CONSUMER RELATIONS IN THE EARLY LATÈNE PERIOD

Author(s): Fuerst, Sebastian (Curt-Engelhorn Zentrum Archäometrie gGmbH, Mannheim; Römisch-Germanisches Zentralmuseum, Mainz) - Armbruster, Barbara (CNRS) - Lockhoff, Nicole - Schwab, Roland (Curt-Engelhorn-Zentrum Archäometrie gGmbH)

Presentation Format: Oral

From the mid-5th c. BC onwards, a new élite emerged in an area that reached from Luxembourg in the west to the Glauberg in the east, mainly covering almost all parts of today's Rhineland-Palatinate, Saarland and parts of Hessen. This élite is reflected by rich burials that usually contain drinking vessels from the Mediterranean world, two-wheeled wagons and above all gold jewellery. In context of the ANR/DFG Project CELTIC GOLD, we were able to analyze the gold objects from various research perspectives: scientifically regarding the material composition, technologically regarding the applied crafting techniques, and from a cultural history point of view regarding the different stylistic features. In this paper we would like to present our preliminary results with focus on our interdisciplinary approach to integrate all the different research findings ranging from scientific analyses and technical investigations to stylistic art interpretation. We suggest a twofold theoretical framework: At first we distinguish between composition groups, manufacturing techniques, and stylistic features. In a second step we perform a network analysis for each different aspect (composition, technology and stylistics). Our first results suggest different topological features of each network like centrality degrees or clustering coefficients. These different networks improve our understanding of the differences and yet interlocking of the distribution, production and consumption systems during that time. This example illustrates that, paradoxically, a separate conceptualization of the different dimensions of metalworking enables an integrative perspective.

10 ACROSS THE EUROPEAN IRON AGE WITH COPPER BASED ALLOYS

Author(s): Danielisova, Alzbeta - Bursák, Daniel (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Strnad, Ladislav - Trubač, Jakub (Charles University in Prague, Faculty of Science)

Presentation Format: Oral

The Iron Age in Central Europe is highly dynamic space and time, with widely discussed mobility of people, ideas and their expressions in form of artefacts. Due to the long tradition of archaeological research of this period, a unique possibilities for application of archaeometric analyses of its abundant material culture developed over the years. However, unlike in the periods from the beginnings of metallurgy, there has been much less attention given to the Iron Age on account of supposed impossibility of gaining the unbiased data due to a complex economy that was characteristic for this period. However, we believe that a large-scale sampling of copper alloys across different social and historical settings does have a great potential to give us a new and unique perspective for reviewing the traditional narration given by archaeology and authors of the classical antiquity. As the general trends in approach to important materials are best revealed in comparison, different socio-economic environments and longer chronological period are being sampled and analysed in the framework of our current project dealing with the archaeometry of coppers alloys in Central Europe between the 4th and the 1st century BC/AD. Our approaches involve bulk and trace compositions together with both common and unique isotopic or elemental tracers. In this paper we would like to discuss the feasibility

of application of particular analytical methods and approaches in regard to interpretation of the data acquired and archaeological questions asked.

11 EMBEDDED KNOWLEDGE, OR THE ARTIFACT AS PRIMARY WITNESS TO ANCIENT METALWORKING TECHNOLOGY

Author(s): Schorsch, Deborah - Becker, Lawrence - Carò, Federico (The Metropolitan Museum of Art)

Presentation Format: Oral

Scholarship has focused on the Gupta age (ca. 320–550) as the quintessential expression of classical Indian art, and on the key role of metal icons in the dissemination and development of Buddhist and Hindu practice during that period and its aftermath into the eighth century. In fact, although well attested in contemporary texts, few bronze figures, and none in gold or silver, survived the decline of Buddhism and the destruction of monasteries during the Muslim invasions, and for those still extant, little attention has been devoted to their manufacture. Close examination of a group of hollow-cast bronze Gupta-style Buddha images from North India has revealed a unique technological style developed to meet the particular challenges of producing three-dimensional, but relatively shallow, figures wearing expansive monastic robes. Unlike most figural metal statuary, the Gupta-style images were cast in a horizontal orientation, with internal gates that directed the molten metal laterally into the billowing draperies. These and other conclusions regarding their manufacture are based on visual examination, computed radiography, volumetric X-ray imaging, and X-ray fluorescence analysis. The spread of this technology to South India and Southeast Asia parallels the wide ranging propagation of the Gupta style, but the specialized knowledge necessary to produce such images points to the movement of experienced craftsmen between these regions and the Gupta heartland.

12 ARCHAEO-METALLURGICAL ANALYSIS: A STUDY OF THE METALLURGY IN EARLY MEDIEVAL SOCIETIES IN WEST BENGAL

Author(s): Chatterjee, Anustup (Techno International Newtown)

Presentation Format: Oral

Archaeo-metallurgy is an interdisciplinary field of study that examines all aspects of the production, use and consumption of metals. This discipline has been concerned explicitly with materiality & characteristic of ancient metal objects and identification of their unique features across time and space.

Archaeo-metallurgical study in early medieval Bengal traces the history and development of metalwork. West Bengal as an integral part of eastern India has a very old tradition of iron technology, as indicated by the metal objects obtained from various archaeological sites. All materials collected from these archaeological sites in West Bengal prove that the ancient alchemy and metallurgical science practiced in this region were rich and vast. The detailed description of metallurgical processes and intricate properties of minerals and chemicals in the 10th-11th century alchemy-text, referred in the Rasaratna Samuchchaya is yet another proof of the high level of knowledge of metallurgy. Metals have a very close relationship with human civilization and the phases attributed to different stages of cultural growth are dominated by the metals being used at a particular period.

Metal objects found from various early medieval sites of West Bengal provide a unique opportunity to study the development of metalworking fashion and technology. A number of excavations & explorations have been conducted to investigate the societal structure and material culture of this period. The study of metal technology also helps us to know the cultural development and craftsmanship.

The present study involves scientific analysis of metal objects obtained from two very culturally rich archaeological sites Kankandighi and Moghalmari in West Bengal. It will also highlight the archaeo-metallurgical perspectives and character as revealed by the samples collected from excavated sites. Upon performing different test on the collected samples, the results would give a clear picture regarding the purity of the metal used for different purpose.

13 3D LASER SCANNING AS A TOOL FOR VIKING AGE STUDIES

Author(s): Neiss, Michael (Department of Archaeology and Ancient History, Uppsala University) - Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA/Getty Conservation Programme; Division of Biophysics, Stockholm University)

Presentation Format: Oral

3D laser scanning is a non-destructive and versatile technique that provides archaeologists with new opportunities. In our paper, we explore the utility of 3D modelling as a analyzing tool for copper alloy objects and casting moulds from the Viking world. Our pilot studies show that 3D modelling is a valuable tool for iconographic documentation, artefact reconstruction and production analysis. Results from these object studies also pave the path for novel and creative research strategies. For instance, 3D-laser scanning on debris from an early workshop site at Ribe led to a re-assessment of the chronological relationship between different production phases. This produced a substantially clearer image of this rare episode of metal casting and motivated a reevaluation of the scale and time frame of the workshop activity. In consequence, 3D-model-based analysis appears to be useful for answering traditional questions in Viking Age artefact studies, and may also inspire innovative approaches when combined with other methods.

14 METALLOGRAPHIC EXAMINATION OF IRON ARTEFACTS FROM THE 4TH – 12TH C. CULT SITE OF TORTUNA, SWEDEN

Author(s): Saage, Ragnar (University of Tartu) - Wärmländer, Sebastian (Stockholm University)

Presentation Format: Oral

This study concerns metallurgical examination of iron artefacts excavated at the 4th – 12th c. site of Tortuna, Sweden. During the 4th – 7th c. Tortuna was a settlement location with a farmstead and a pagan cult site. Although the farmstead was abandoned in the early 7th c., the cult site continued to be used and was later expanded. The pagan cult site was eventually abandoned when a Christian church was erected around the 11th – 12th c. Various iron artefacts have been encountered at the site, including common utility objects such as nails and horse cleats, weapons/tools such as knives and spearheads, and ritual objects such as amulet rings. Our metallurgical results show a large range of craftsmanship and material qualities in these items. Some were made from relatively soft and carbon-free ferritic iron, while the knives were skilfully made from hardened steel. Two spearheads had been coated with a thin layer of rather pure copper, likely for aesthetic reasons and possible ritual use. The copper coating had been applied in a molten state, demonstrating the capability of brazing at temperatures of at least 1100 °C. The high material quality of the steel knives raises the question why so many other objects were made from low-quality iron. The reasons for these material choices are discussed in relation to the possible uses for the studied objects and the work effort needed to improve the material quality.

15 WORKING INTERDISCIPLINARY – KING CANUTES WORKSHOP IN VIBORG

Author(s): Jouttijarvi, Arne (Heimdal-archaeometry)

Presentation Format: Oral

The investigation of a late Viking Age workshop in Viborg in Denmark was made some years ago, but can still serve as an example of a very successful interdisciplinary collaboration. The collaboration included, in addition to an archaeologist, also an archaeometallurgist, an archaeobotanist and a dendrochronologist. In addition, there were a number of minor contributions from researchers, which, for example, looked at waste from comb production and on remnants of spiders.

By combining the data generated by the various disciplines, it was possible to follow the workshop's history in detail, from being built in 1018, over a three-year period of use between 1019 and 1022, after which the building lay unused but still remained maintained until 1025 when it was demolished. It was only used during the winter months, while in the summer plants grew in the floor layer. It could also be seen that repairs were made, among other things, of the roof.

It is possible that the workshop, which is just one of several in the area, can be linked to Canutes return to Denmark in 1019-1020, in order to secure his power as king.

16 HUMAN BEHAVIOUR IN METALLURGICAL STUDIES; THE CASE OF A VIKING-AGE BLACKSMITH

Author(s): Roxburgh, Marcus Adrian (Leiden University)

Presentation Format: Oral

Excavations of an 11th century, Viking-age, metalworking site and associated cemetery uncovered the remains of two blacksmiths along with their rich grave finds. The location, at Raatvere, Estonia, alongside the banks of lake Peipsi, placed them directly in contact with one of the great riverine trade routes between the Scandinavian world in the North and the Byzantine world, far to the south. As no metal ores are mined in the region, the copper-alloy that made the weapon and belt fittings, bracelets, strap-ends and other personal adornments must have originated some distance away. Were these craftsmen local? or had they come to Raatvere from somewhere else, perhaps along the long distance trade route? Could anything be gained from establishing the composition of the copper-alloys that contributes to their archaeological story?

This paper explores some metallurgical approaches to exploring these Viking age objects, starting with a non destructive pXRF survey that determined their basic characteristics.

17 WIRE-DRAWING IN VIKING AGE SCANDINAVIA

Author(s): Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA, Los Angeles)

Presentation Format: Oral

Metal wire is in modern society produced by drawing metal rods through tapered holes of increasingly smaller diameters. The origin of this wire-drawing technique is unclear, and has been a topic of interest for over a century: Heinrich Schliemann stated that the gold chains he and his wife Sophia found at Troy were made by wires that had been drawn, while Sir Flinders Petrie held that all ancient wires he had observed in Egypt displayed evidence of hammer blows. Current evidence suggest that the wire-drawing technique was invented somewhere in Europe during the 1st millennium AD, replacing earlier techniques for the manufacture of gold and silver wire such as hammering, block twisting, strip-twisting, strip-drawing, and roll-drawing. Many of the earliest tools for wire-drawing have been found in Viking Age Scandinavia, possibly suggesting that this is where the technology was first developed. The Scandinavian tools were made either from iron or from bone/antler, and the wires drawn were typically made from silver or tin. Here, we describe the current understanding of the origins of Scandinavian wire-drawing, and present new results based on SEM-EDS analysis of wire-drawing tools.

18 TECHNOLOGICAL TRADITIONS IN THE BLACKSMITH CRAFT OF ANCIENT RUS

Author(s): Zavyalov, Vladimir - Terekhova, Natalia (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

As known, the blacksmith's craft was one of the leading branches of the ancient economy. The possibilities of studying various aspects of the history of this production have greatly expanded with the introduction of metallography into archaeology. The Laboratory of natural science of the Institute of Archeology of the Russian Academy of Sciences has a great base of archaeometallographic analyzes, which allows to solve both technological, and cultural and historical problems. On the basis of the analytical data characterizing the smithing artifacts of Ancient Rus, we were able to establish that the Ancient Rus blacksmithing craft was based on the interaction of two technological traditions: the Scandinavian and Slavic ones. For the first, the technology of the so-called three-fold welding was typical, for the second, the technology of welding-on. The Scandinavian tradition most clearly manifested itself in the emerging urban craft (IX - XI centuries). Its introduction had an explosive character, but did not have a significant impact on the further development of the Ancient Rus blacksmith's craft. Slavic tradition spreads gradually and finally replaces the Scandinavian tradition in the XII century. It turned out to be more sustainable and retained its value until the beginning of the industrial production of iron objects.

19 IRON IN BUILDING CASTLES – IS IT WORTH OF INTEREST IN MEDIEVAL RESEARCH?

Author(s): Rimkiene, Egle (Klaipeda university)

Presentation Format: Oral

There is various ways and materials in castle building. Some were built of wood, some of stone, or bricks, and some of all before mentioned materials mix. During building process all these materials in one or another way were connected to each other.

It is known that iron in building castles in Lithuania was started to use in 14th century by the Grand Duchy of Lithuania. Due to that and because of The Grand Duchy of Lithuania and Teutonic order conflicts there was some Teutonic Oder castles built in 13th - 14th century at the nowadays territory of Lithuania.

The aim of this presentation is to compare the iron used in building castles by Lithuanians and by Teutonic Oder at the Lithuania territory in 13th - 14th centuries. It is expected to present the differences and similarities between used iron material and findings (especially the ones which were used during building process) and also to answer to the question: is it worth of interest in research?

20 TEXTILE MANUFACTURING AND LEATHERWORKING METAL TOOLS IN THE LIGHT OF ARCHAEOMETRIC INVESTIGATIONS. THE STUDY OF SELECTED ARTEFACTS FROM POLAND

Author(s): Miazga, Beata (University of Wroclaw)

Presentation Format: Oral

The study of artefacts provide knowledge of various life's aspects of our ancestors. It is extremely important in the discovery of their everyday activities and works, like making and using various tools. The development of craftsmanship that accompanied the development of societies is also possible to be recognised through the archaeometric research. The results of such investigation answers many general questions: 'what' (raw materials identification), 'how' (manufacturing process), 'why' (functional analysis). Such studies are significant part of considerations concerning the economic status as well as the level of craftsmanship, e.g. sewing and shoemaking. Within this research, not only the investigations on the artefact relicts (fabrics, knitwear, leather) but also on the tools are carried out. In the Middle Ages and the Early Post-Medieval period varied groups of tools were used during the textile and leather working. In this group were generally iron and steel scissors, shears, different types of knives, awls, needles as well as pins or thimbles (made of copper alloys). The aforementioned artefacts from Poland were analysed by various metallurgical methods (SEM-EDS, ED-XRF, OM and metallography). The selected methods are non-destructive or less invasive, which is important for the studies of cultural heritage.

21 POSSIBILITIES AND LIMITATIONS OF ANALYTICAL TECHNIQUES TO STUDY THE SURFACE OF MARINE PRECIOUS METAL

Author(s): van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Beentjes, Tonny (University of Amsterdam) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - Kuiper, Elisabeth (University of Amsterdam; Atelier Elisabeth J. Kuiper) - van Eijck, Lambert - Zhou, Zhou (Delft University of Technology) - van Bommel, Maarten (University of Amsterdam)

Presentation Format: Oral

The surface of archaeological metal is valuable in terms of information. Platings and decorations may still be present on artefacts from precious metal from a marine context in a nearly pristine state, compared to historical objects. Corrosion often hinders the identification of the original surface with the unaided eye. Consequently, the establishment of the ancient metalworking techniques that have been used is not optimal. In this research, multiple non-invasive analytical techniques that extract information have been applied to precious metal objects that have been salvaged from the sea. This presentation will focus on the possibilities and limitations of these techniques. Examples are X-ray imaging, X-Ray Fluorescence (XRF), micro-computed tomography (μ -CT) and neutron tomography.

The artefacts studied in this research are recovered from a 17th century shipwreck that contains many other objects from dif-

ferent material categories. Additional information from other disciplines, like conservation and iconography, is used to construct the biographies of the precious metal artefacts, also in relation to the other finds in the wreck. The presented research is part of a larger, interdisciplinary, Dutch project ('AMOR') that aims to develop an interdisciplinary, innovative strategy after excavation for precious metal, for everyone involved in the handling of archaeological metal.

22 THE BIRINGUCCIO LADLE – THE USE OF WRITTEN SOURCES IN ARCHAEOLOGICAL METALLURGY

Author(s): Jouttijarvi, Arne (Heimdal-archaeometry)

Presentation Format: Oral

The results of metallographic analysis are often interpreted from the viewpoint of a modern perception of materials and processes. However, this may often be misleading as the raw materials in the past were often different in composition and form. At the same time, the perception of which characteristics was of importance was often different from what it would be today.

One example is a casting technique, which seems to have been widely used from 14th to 16th century, but which has hitherto apparently avoided being noticed in archaeological excavations. Probably because it differs greatly from the methods you normally imagine from the period.

Glazed fragments of clay with copper traces were thought to originate from furnaces used for bronze casting. However, on the basis of Birringuccio's "De la pirotechnia" from 1540, they could be interpreted as fragments of a form of ladles. That is, large open crucibles made from plain clay in an open basket of iron. Heating took place as known from the Bronze Age, by burning charcoal on top of the crucible. Not, as otherwise known from the Middle Ages, by charcoal lying around the crucible. Interpretation might not have been possible without the written source.

A. THE FIRST RESULTS OF COMPOSITION AND TECHNOLOGY OF EARLIEST IRON ITEMS FROM SITES OF EASTERN EUROPE (3-1ST KA BCE)

Author(s): Kulkov, Alexander (St.Peterburg State University) - Kashuba, M.T. (Institution for the History of Material Culture, Russia) - Morgunova, N.L. (Orenburg State University) - Kulkova, M. (Herzen State Pedagogical University) - Vetrova, M.A. (St. Petersburg State University) - Streltsov, M.A. (Herzen State Pedagogical University)

Presentation Format: Poster

The appearance of iron items in the cultures of Bronze-Iron Ages had place from the Ural to the Carpathians during 3-1st millenniums BCE. The investigations of iron technology of different cultures developed in this time on this territory are very important. The reconstruction of iron elaboration from using meteoric iron to bloomery iron process, the chronology of development of iron technology, influence of paleoenvironment on spreading of this technology allows to give the answer on such significant question: was the eastern Europe one of the independent centrum of Iron metallurgy in the Ancient World or appearance of iron was connected with Cimmerian and Scythian influences. Such research is very actually because of the new Russian idea about the "transition period" between Bronze Age and Iron Age in the "system of three Ages" of Christian Jürgensen Thomsen. The first results of iron object compositions from main archaeological sites of the Eastern Europe (such as Butor, Saharna – Moldova, Boldirevo –Russia) were obtained. For investigations the complex of methods: thin section analysis, geochemical and mineralogical analysis with using of SEM-EDX, XRF and MS had been applied.

Acknowledgement: This research is supported by RFFB project № 18-09-40063.

193 PATTERNS OF THE DEEP PAST. INTERROGATING THE 'LONG TERM' IN ARCHAEOLOGY AND HISTORY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Hussain, Shumon (Faculty of Archaeology, Leiden University) - Porr, Martin (Archaeology/Centre for Rock Art Research and Management, The University of Western Australia; ARC Centre of Excellence for Australian Biodiversity and Heritage, Monash University) - McGrath, Ann (Laureate Program for the Deep Human Past, College of Arts and Social Sciences, Australian National University)

Format: Regular session

Both historians and archaeologists are fundamentally concerned with documenting and explaining long-term change. Yet, there is surprisingly little exchange between the two disciplines and both have cultivated different concepts, theories, and visions of the 'long term'. This situation is understandable in so far as the often-divergent nature of historical and archaeological evidence affords different perspectives and interpretations, but it is also problematic, as each discipline may be diminished by failure to productively engage with the other. Moreover, there appears to be a growing transdisciplinary consensus that phenomena of the 'long term' should be distinguished from their 'short term' counterparts. In historical research, for example, the theme of 'scale' has become prominent, with scholars beginning to reflect more deeply upon the internal dynamics and dialectics of varying temporalities of change. In a similar vein, archaeologists have started to expose diachronic patterns and asymmetries shaping long-term trajectories and to explore emergent configurations of stability and transformation which cannot be explained only by short-term processes. Key notions such as 'temporality', 'causality', and 'historicity' arguably must be re-considered in this light. What is the specificity of long-term phenomena? What are the mechanisms that drive them? What is the ontological status of long-term patterns? What is the relationship between regional and global histories of long-term dynamics?

The aim of this session is to address some of these questions in the hope of contributing to an integrated, interdisciplinary ap-

proach to the 'long term'. We aspire to bring together scholars who work in different geographic/environmental settings, focus on different types of evidence (e.g. lithic technology, ceramics, 'art', textual sources), and tackle varying time frames. Our declared ambition is to discuss phenomena related to the 'deep past' and the 'long term' in the broadest possible way and to ignite new dialogues between theoretical concerns and situated case studies.

ABSTRACTS

1 INTRODUCTION TO PATTERNS OF THE DEEP PAST

Author(s): Porr, Martin (University of Western Australia) - Hussain, Shumon (Leiden University) - McGrath, Ann (Australian National University)

Presentation Format: Oral

Both historians and archaeologists are concerned with documenting and explaining long-term change. Yet, there is surprisingly little exchange between the two disciplines and both have cultivated different concepts, theories, and visions of the 'long term'. This situation is understandable in so far as the often-divergent nature of historical and archaeological evidence affords different perspectives and interpretations, but it is also problematic, as each discipline may be diminished by failure to productively engage with the other. Moreover, there appears to be a growing transdisciplinary consensus that phenomena of the 'long term' should be distinguished from their 'short term' counterparts. In historical research, for example, the theme of 'scale' has become prominent, with scholars beginning to reflect more deeply upon the internal dynamics and dialectics of varying temporalities of change. In a similar vein, archaeologists have started to expose diachronic patterns and asymmetries shaping long-term trajectories and to explore emergent configurations of stability and transformation which cannot be explained only by short-term processes. Key notions such as 'temporality', 'causality', and 'historicity' arguably must be re-considered in this light. What is the specificity of long-term phenomena? What are the mechanisms that drive them? What is the ontological status of long-term patterns? What is the relationship between regional and global histories of long-term dynamics?

2 THE DEFEAT OF HISTORY? EXPLORING CONCEPTIONS OF THE DEEP HUMAN PAST ALONGSIDE ONTOLOGIES OF TEMPORALITY

Author(s): McGrath, Ann (Australian National University)

Presentation Format: Oral

In 1953, the anthropologist of Aboriginal Australia WEH Stanner wrote an essay entitled 'The Dreaming'. He concluded that: "The value given to continuity is so high that they are not simply a people 'without a history', they are a people who have been able in some sense, to 'defeat' history, to become a-historical in mood, outlook and life." We must be wary of the term 'a-historical', which is culture and time bound in a distinctively modernist framing. Have Aboriginal ontologies indeed defeated 'history'? Arguably the study of the deep human past has defeated the discipline of history. While many historians still define their discipline as a study of change, others note that it is inevitably a study of the present, framed by present questions and concerns. This paper suggests that focussing upon change may thwart a historical study of the deep past, which on the continent of Australia, may be better told as a story of continuity. Drawing upon Francois Hartog's *Regimes of Historicity* (2015), I also note how anthropologists Claude Levi-Strauss and Marshall Sahlins offer useful perspectives on the relationship between history and society. The paper then considers whether Australian indigenous ontologies, especially their approach to a long term, multi-layered temporality, may not actually 'defeat' history, but rather, may offer enlarging opportunities for the future of the discipline.

3 MAROPENG: THE FIRST OPEN-AIR ACCUMULATION OF EARLY ACHEULEAN LITHIC MATERIAL IN SOUTH AFRICA'S CRADLE OF HUMANKIND

Author(s): Moll, Rosa - Kuman, Kathleen - Morrissey, Peter- Stratford, Dominic (University of the Witwatersrand)

Presentation Format: Oral

Maropeng is the only known open-air Earlier Stone Age site in the Cradle of Humankind, South Africa, which is estimated to cover an area of approximately 191200m². Archaeological material was accumulated over time from the surrounding landscape through low-energy slopewash, creating a sealed artefact-bearing horizon through colluvial processes. From the geoarchaeological work, it is evident the artefacts derive not from a single depositional event but accumulated from various higher points on the landscape within 1km. The nature of the horizon means it is not possible to date the deposit, and that small pieces have been winnowed from the assemblage while pseudo-small flaking debris is present from in situ quartz breakage. This study aimed to identify technological episodes in the deep past along with an assessment of the biased nature of the deposit. A description of the site context and material will be presented, and a discussion as to how the authors went about using a technological reduction analysis of larger stone tools like cores and large cutting tools (LCT) to interrogate temporal episodes in the ESA and assign material to the relevant techno-complex. The technological patterns that were used for this show a dominance of simple reduction strategies and limited raw material exploitation that was restricted by tabular blank shape. However, a small percentage of the cores shows a more organised arrangement of flake scars, indicating that the stone tool makers were capable of overcoming the limitations presented by raw material blank shape. Taking into account the significance of temporality of the site and these reduction patterns helped the authors determine the Early Acheulean assignment at Maropeng.

4 VIBRANT TIME. MULTIPLE TEMPORALITIES AND RHYTHMS OF CHANGE AND STABILITY IN THE EUROPEAN UPPER PALAEOLITHIC

Author(s): Porr, Martin - Velliky, Elizabeth (University of Western Australia; Universität Tübingen)

Presentation Format: Oral

Traditionally, the concern with the oldest periods of human history is dominated by a focus on the long-term and a generalised and averaged view of human behaviours. At the same time, it has long been recognised that Palaeolithic archaeology provides some of the most astonishing insights into individual episodes of human actions in the deep past. Integrating these different temporalities in a meaningful way remains a key challenge for deep time archaeology, which is also reflected in the tension between hegemonically defined periods (e.g. Magdalenian, Aurignacian, Mousterian, Acheulean etc.) and the inferred pressures of resource and time management within evolutionary ecological interpretative frameworks.

In this paper, we want to argue that the detailed synchronic and diachronic analysis of Palaeolithic evidence allows reflecting on the multiple temporalities during the Palaeolithic. It also allows an understanding of these deep time contexts that appears to be much closer to historical approaches towards human agency, culture and time. We draw on recent analyses of material expressions during the Upper Palaeolithic from Southwest Germany (ca. 45k – 15k years ago). Our results demonstrate that people during this time were entangled in multiple temporalities that neither follow the established cultural periods nor the necessities of functional pressures and adaptation. For example, the exploitation of ochre pigments exhibits an intricate network of source locations and patterns of selection, which were maintained throughout millennia in Central Europe. Pigment use intersected with the social memory of populations in such a way that respective practices were maintained throughout generations despite changes in mobility patterns and climate and environmental conditions. Similarly, the development of figurative art and related objects exhibits rhythms that link established cultural periods in complex patterns of change and continuity that are related to different types of social memory and the social creation of identity.

5 MAKING USE OF INCOMPATIBLE PARADIGMS: PATH DEPENDENCE, NICHE CONSTRUCTION AND THE 'CIVILISING PROCESS'

Author(s): Hussain, Shumon (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

The comprehensive investigation of 'long-term' phenomena is complicated not only by what can be called the 'problem of intuitive grasp' but also by an overwhelming diversity of approaches and concepts of possible relevance, without much conceptual clarity and understanding of how they interrelate. This paper argues that due to this condition, the synergetic potential of key concepts from different schools of thought has hitherto largely been overlooked. In an attempt to overcome this deficiency, I propose that the notion of 'civilisation' coined by Elias and Febvre in the context of structural history and figurational sociology, the idea of 'niche construction' advocated by Schrödinger and others and presently experiencing a second advent in modern ecological-evolutionary theory, and the concept of 'path dependence' originally developed by Arthur and others in historical economy and organisational sociology can profitably be integrated to more effectively examine emergent patterns of the deep past. The paper outlines the core insights of each of the three notions and draws out the synergetic relationships between them. As a proof of concept, I re-visit the classic Upper Palaeolithic sequence from Western Europe and show how a combined application of the three concepts may enrich our apprehension of this certainly critical time frame in early human evolution.

6 MAKING SENSE OF MATERIAL CULTURE TRANSFORMATION: A CRITICAL LONG-TERM PERSPECTIVE FROM JOMON AND YAYOI PERIOD JAPAN

Author(s): Mizoguchi, Koji (Kyushu University)

Presentation Format: Oral

This paper argues that material culture transformation can be understood as the transformation of the way human beings and material culture mutually open up their potentialities. Such opening-up/becoming takes place in the domains of their encounter, which often take the form of human communications. In communication, human beings and material culture mutually mediate, intervene, and/or transform their modes of existence through coping by the former with various uncertainties and risks that the world generates and that communication differentiates. By drawing upon the sociologists Niklas Luhmann's theory of communication and social systems and Deleuze and Guattari's theorization of the 'Diagrammatic' mutual constitution of subjective and objective factors, the paper will elucidate and elaborate on this perspective through examining the long-term transformation of the mode, or the diagrammatic constitution, of such mutual opening up/becoming by human beings and material culture of their potentialities, that took place in the Jomon and the Yayoi periods of Japan.

7 LONG-TERM DEVELOPMENTS IN BRONZE AGE BURIAL CUSTOMS IN THE SOUTHERN URALS

Author(s): Schreiber, Finn (Free University Berlin)

Presentation Format: Oral

In the Southern Urals (Russia/Kazakhstan), archaeologists traditionally distinguish several Bronze age cultures. Cultures of the middle and late Bronze Age are mainly known from numerous burial sites. However, these cultures show strong affiliations to each other and their spatial and chronological relations are not clear.

A new chronological model based on multivariate analyses of funeral ceramics now provides a framework for dating funeral con-

texts of the middle and late Bronze age in the Southern Urals area. This model allows an overview over different aspects of burials (grave goods, grave construction, spatial context, corpse preparation, etc.), but raises new questions as well. Results show changes and continuums in burial customs in this area over a range of about 500 years. Many aspects of funeral culture turned out to be part of gradual, long-term developments overarching different cultures. This paper will describe main aspects of Bronze Age burial customs and their long-term developments and discuss possible motivations and intentions behind them.

8 KITCHEN TECHNOLOGY AND LONG-TERM CHANGE IN IRON AGE SCANDINAVIA

Author(s): Bukkemoen, Grethe (Dep. of Archaeology, Conservation and History, University of Oslo)

Presentation Format: Oral

The Iron Age in Scandinavia was characterised by periods of continuity, interrupted by times of rapid change. A marked shift visible in the archaeological record from the mid-6th century AD seems to be related to a substantial social reorganisation. Moreover, the detectable changes in artefact categories have come to define the transition from the Early to the Late Iron Age (500 BC–AD 550/AD 550–1030). Crises, as well as long-term processes, have been suggested to lie behind these changes. However, recent studies have acknowledged both temporal and spatial variability within the archaeological record, providing more nuanced and complex interpretations. During this transitional period kitchen technology went through considerable change when a long-term tradition of high quality pottery production ended giving way for a larger variation of vessels, cauldrons and frying equipment of soapstone and iron. The last few decades have seen a noticeable broadening in archaeological approaches to food and kitchen technology in the understanding of prehistoric societies and social change. Moreover, complex understandings of change have been developed through approaches addressing the relational properties of entities and the absence of “clean transitions” between phases. In this paper I address the dialectic between long-term and short-term change through the perspective of food technology. Through a diachronic and relational approach, I explore kitchen utensils and types as historically situated emergent assemblages.

9 LONGUE DURÉE VS REAL-TIME. EXPLORATIONS IN THE TEMPORALITY OF (DIGITAL) ARCHAEOLOGICAL OBJECTS

Author(s): Stobiecka, Monika (University of Warsaw)

Presentation Format: Oral

A recent interest in material culture, entanglements, new materialisms, and object-oriented approaches visible in contemporary archaeology occurs concurrently with discipline’s gravitation towards digital, virtual and cyber practices. This interesting clash of two, apparently antagonistic paradigms, calls for a theoretical reflection upon archaeology’s central object of inquiry: an archaeological artifact and its temporal character.

Central to my considerations will be the notion of “real-time,” widely present in digital and cyber archaeology. I will treat this term, originating from computer application, as an opportunity to ask questions about the temporal character of (digital) archaeological objects.

“Real-time” in the first place refers to the questions of reality, hyperreality, representation, subjectivism and objectivism. As digital archaeological objects are being rendered in real-time, they encourage us to investigate the actual character and status of obtained data. What does this mean for an artifact or an archaeological site to be recorded in real-time? To be a timeless simulacrum (Baudrillard) with material references that no longer matter?

Secondly, “real-time” invites us to think about time, temporalities and events. Assuming that archaeologists are working on vibrant matter (Bennett), we can investigate the relation between real-time technologies and materiality. Is real-time truly a form of registering unstable reality, or rather a form of stopping time? The questions of time and temporality incorporate also notions on widely understood materiality and metamorphosis.

Treating “real-time” as a theoretical metaphor and a fertile ground for methodological explorations, I will investigate the temporal character of (digital) archaeological objects.

196 GENDER AND OTHER BARRIERS: ARCHAEOLOGICAL PERSPECTIVES

Theme: Global change and archaeology

Organisers: Soares, Joaquina (MAEDS - Museum of Archaeology and Ethnography of the District of Setúbal/AMRS; UNIARQ - Centre of Archaeology of the University of Lisbon) - Sousa, Ana Catarina (UNIARQ - Centre of Archaeology of the University of Lisbon) - Escoriza Mateu, Trinidad (Universidad de Almería)

Format: Regular session

Gender archaeology emerged in the 1980s associated with the third wave of feminism, which led to the incorporation of post-structuralist theories. The aim was to make women visible in the archaeological record and to denounce the hegemonic androcentrism that had been framing archaeological studies.

In the 1990s there were some changes in the theoretical framework, namely with the introduction of queer theories and transsexual feminism, with the radical rejection of biological determinism and patriarchal society, has become a widespread phenomenon that crosscuts several social sciences, such as anthropology and archaeology.

The archaeological focus on the male/female barrier of social inequality (the binary gender) brings to light the social commitment

and political relevance of our discipline. The multi-temporality and pluralism of archaeological approaches can give valuable contributions to the current debates and to the key set of ideas on the following subjects:

- Deconstruction of sexual versus gender relations in different times and places based on the empirical record (domestic contexts, funerary spaces, shrines and rock-engraved art);
- Engendering the Past: Women and figurative representations, power and ideology in non-literate societies.
- New insights into theoretical issues, methodologies and high tech archaeological science tools (materials science, ecological analysis, DNA and isotope analyses, organic residue analyses of prehistoric pottery) that can bring to the fore crucial situations of social inequality.

ABSTRACTS

1 GENDER AND OTHER BARRIERS: ARCHAEOLOGICAL PERSPECTIVES - INTRODUCTION

Author(s): Soares, Joaquina (University of Lisbon)

Presentation Format: Oral

The aim of this session is to enlarge and conciliate archaeology with the great problems of the contemporary world, strengthening the social commitment and political relevance of our discipline.

Gender frontiers are a standing operative mechanism that divides Humanity in two opposite and conflicting halves during a so long paths that deconstruction process must be continued, in a global and plural perspective.

Case studies, regional or worldwide visions from social integration of sex/gender relations can be of crucial importance to understand current gender inequalities and inter-sexual violence that crosscut quite different social formations.

Since the decade of 1970 a significant number of archaeologists have been participating into the debate on women discrimination, both in the past reconstructions and in the discipline itself. Nowadays archaeology provides new insights into theoretical issues, methodologies and high tech science tools reinforcing its active role on the research about the future of un(gendering) social relations of production and reproduction.

2 WOMEN AND ARCHAEOLOGY. AN APPROACH TO THE STUDY OF FIGURATIVE REPRESENTATIONS

Author(s): Escoriza-Mateu, Trinidad (University of Almeria)

Presentation Format: Oral

In this essay we tackle the study of archaeological Figurative Representations. To that end, we propose the use of theoretical and methodological strategies which may be far from relativist universalist and essentialist positions, because it usually shows the collective social and sexual subjects associated with unavoidable fates. Therefore, we would like to raise the need for an archaeological theory that do not allow arbitrary and pre-constructed studies. We argue for an archaeology like social science committed to improving the living conditions of women and men in society. Hence, for address the problem of idealism and prevailing androcentrism, we claim the no-sexist use of scientific knowledge, and appropriate methodology. Moreover, we consider that Figurative Representations studies promote -due to the conservative presence of the Capitalist and Patriarchal Archaeology- the strengthening of perverse and misogynous stereotypes. An alternative Feminist perspective in Archaeology is required, with a Sexuate Past as objective of research.

3 THE WOMAN IN THE ARCHAEOLOGICAL DISCOURSE OF THE 21ST CENTURY: (IN)VISIBILITY IN THE ANCIENT PEASANT SOCIETIES OF THE IBERIAN PENINSULA

Author(s): Sousa, Ana Catarina (UNIARQ, Center for Archaeology of the University of Lisbon)

Presentation Format: Oral

The archaeological discourse of the pre-historians of the Iberian Peninsula reflects a mosaic of very different theoretical positions and praxis.

In the 21st century the woman is practically invisible from the main research themes related to the ancient peasant societies (6th to 3rd millennia BCE, Neolithic and Chalcolithic). This invisibility is in some way inexplicable when there are major advances in laboratory and field analytics and also in conceptual frameworks. The explanation for this situation can be explained by the theoretical positions, by the archaeological invisibility of the gender relations or even by the reduced expression of the social differentiation of women in these societies.

It is especially relevant the differences between the Portuguese and Spanish panorama: in Portuguese archaeological discourse the woman is more hidden. It is intended to analyze and discuss this invisibility relating with the social contexts of the archaeologists and also with the need to change the research agenda.

4 WHO IS THE WOMAN IN ASHURBANIPAL'S GARDEN AND WHAT IS SHE DOING THERE?: DECONSTRUCTING NEO-ASSYRIAN ROYAL NARRATIVE

Author(s): Zhao, Jianing (Princeton University)

Presentation Format: Oral

The "Banquet Scene" relief from the North Palace of Ashurbanipal has long been considered one of the most remarkable and enigmatic subjects in ancient Near Eastern art, known for its jarring depiction of the defeated Elamite king's head hanging on a tree during the Assyrian royal feast. Much scholarship has been devoted to the garden landscape where the feast takes place, but little on the gender dynamics at play. A consensus about the queen's identity has not yet been reached, as most scholars assumed that she is Ashurbanipal's wife, while some have suggested that she might be an Elamite queen or even a high-ranking eunuch Schmidt-Colinet 1997). [1] This paper aims to offer a new, gendered reading of this famed relief, by shedding light on the queen's identity and function through cross-cultural and transhistorical contextualization of her iconography, as well as bringing into attention the hitherto neglected figures of the female attendants in the scene, to deconstruct the discourse of domination of the women and through the women as part of the Assyrian visual propaganda.

[1] J Álvarez-mon, "Ashurbanipal's feast: a view from Elam." *Iranica Antiqua* 44 (2009): 131-180; Constanze Schmidt-Colinet, "Ashurbanipal Banqueting with his Queen? Wer thronht bei Assurbanipal in der Weinlaube?" *Mesopotamia* 32 (1997): 289-308."

5 SEARCHING FOR ZERO GENDER IDENTITIES IN IBERIAN PREHISTORY

Author(s): Soares, Joaquina (Archaeological Centre of the University of Lisbon; MAEDS - Museum of Archaeology and Ethnography of the District of Setúbal/AMRS)

Presentation Format: Oral

At the center of the world economic system, the male/female opposition seems to be in collapse. Currently with the women emancipation in the most developed western countries the gender opposition no longer offers sufficient inequality for capital valorization. But in the peripheries of the system, historical time has another pace and Late Capitalism actively promotes the binary gender and women disempowerment in order to naturalize and legitimate the overexploitation of female labor through false biological and cultural arguments. In opposition to this political scenario, young and radical movements related to queer theories claim the zero gender as an individual identity.

Focusing on the Iberian Neolithic we will search for cultural evidence that can deny the "axiomatic" bipolar division of humans in female and male gender hierarchical categories.

From the Early to the Middle Neolithic, the rock and mobile schematic art we analyze display sexual parity or even a higher social status for women; this time span corresponds to the zero gender times. After Late Neolithic a slow declining of women status can be read in the archaeological record simultaneously with the empowerment of men status. In the Bell Beaker period hierarchical binary categories of sex/gender seems to acquire visibility. Therefore, we advocate that patriarchal society could disappear if binary gender categorization dropped, dissociated from sexual differentiation. Although this statement seems very simple and may be easily acceptable, in fact for its effectiveness, it will require a crucial social change in the relations of local production scale and in the current international labor division ruled by a worldwide hegemonic and almost invisible political power system.

6 BETTER THAN MEN? WOMEN AND RELIGION IN ROMAN DALMATIA

Author(s): Mech, Anna (University of Warsaw)

Presentation Format: Oral

The nature of available sources means that most of what we know about the religiosity of the inhabitants of the Roman Empire are the very public activities, which were mostly reserved to the wealthier and privileged echelons of society. Altars, votive tablets, statues and offerings were set up as a socially important act of piety, meant – among other reasons – to express the position of the dedicant, and requiring substantial funding. This in most cases meant that the dedicants were male. When combined with the fact that women were allegedly excluded from activities such as drinking wine or cutting raw meat – both needed in religious rituals – we see that women were almost left out of the public religion. As such, the study of the relatively fewer monuments and sources mentioning females active in the sphere of cult can contribute to a better understanding of the under-represented phenomenon of individual religious belief in antiquity.

The aim of this paper is an attempt to reconstruct the religious life of women who lived in Dalmatia. The paper will present not only the choices that women made when engaging in religious life but also some important aspects of their private life. Through analysis of texts of inscriptions the most valuable insight will be reached into the beliefs of individuals and in what ways the "female religiosity" differed (if at all) from the dominant ancient male narrative.

Theme: Global change and archaeology

Organisers: Jervis, Ben (Cardiff University) - Baumanova, Monika (University of West Bohemia in Pilsen)

Format: Regular session

This session explores how we can re-imagine the public benefit of urban archaeology (across any time period or location) in light of the increasing adoption of field and digital technologies which enable the development of ever more 'high resolution' understandings of past urban societies. Contributors are asked to explore ways in which archaeological data might be used to open new areas of research which address or align with the concerns, identities and challenges of contemporary urban communities such as environmental sustainability and resilience, migration, and social inequality.

An ambition to engage archaeological research in other policy areas to maximise its public benefit is a key pillar of the EAC's Amersfoort Agenda. This framework, when coupled with innovative research approaches in urban archaeology, which include methods as well as innovative cross-disciplinary research questions, creates potential to stimulate the closer alignment of archaeology with the wider field of urban studies on any continent. This, it is proposed, would have the effect of changing how we understand archaeology's public benefit, by creating possibilities for the findings of archaeological work to have direct and tangible impacts on decision making by urban communities outside of the limited scope of heritage management.

The intended outcomes of the session are to:

- Debate how archaeological techniques and perspectives can be applied in innovative ways to address questions of broad relevance.
- Explore how the concept of public benefit in urban archaeology might be re-imagined through the use of archaeological data to better understand the dynamics of urban communities and to have a tangible impact on urban decision making in the present.
- Present best practice examples of how the public and urban practitioners in other fields might be engaged in the co-creation and communication of archaeological research which resonates with, and addresses the concerns of, contemporary urban societies.

ABSTRACTS

1 EXTINCTION OF "SYNANTHROPIC" INSECTS FROM ARCHAEOLOGICAL CONTEXTS: KEY IDENTIFIERS OF ENVIRONMENTAL CHANGES

Author(s): Tuccia, Fabiola - Giordani, Giorgia - Vanin, Stefano (School of Applied Sciences, University of Huddersfield)

Presentation Format: Oral

Archaeoentomology (the study of insect and arthropod remains) provides a means to enhance our understanding of past human activities, as well as species biodiversity, biogeography, and climatic changes. The purpose of this work is to provide evidence, using specific examples from archaeological excavations taking place in Sardinia (Italy) in the last decade, on how entomological records can be interpreted to shed light on global environmental changes.

Our study focussed on the analysis of the entomo-fauna found in association with human remains under the Cathedral of Castelsardo (Sassari). These date from the 17th-19th centuries and include, among other species, the black bottle fly *Phormia regina* (Diptera: Calliphoridae). Moreover, thousands of puparia (formed from the cuticle of the third instar larvae, where the metamorphosis occurs) of the sea-weed fly *Thoracochaeta zosterae* (Diptera: Sphaeroceridae) were found in soil deposits collected from a medieval well in the city of Sassari. Despite the differences between these two contexts, the entomological findings show a striking similarity in terms of the unusual character of the species present. There are no modern records of *P. regina* and *T. zosterae* available from Sardinian private or museum collections, as far as we are aware. The extinction of the species could be potentially caused by the change of the landscape use and by the climate change as the distribution and the seasonality of the flies are temperature dependent and species-specific. Other reasons for the extinction can be related with changes in the commercial routes of the island with the introduction of competitors or predators/parasitoids. However, the latter hypothesis still needs further validations. Moreover, it is worth to mention that also modern records concerning forensic entomological cases support our hypothesis as in the case of *Synthesiomyia nudiseta* (Diptera: Muscidae) which has only recently found its optimal developmental conditions in Southern Europe, after being brought by naval commercial routes from China or South America.

2 BUILT TO BALANCE – ACHIEVING SPATIAL EQUILIBRIUM IN URBAN LAYOUTS

Author(s): Baumanova, Monika (University of West Bohemia, Pilsen)

Presentation Format: Oral

The success and failure of urban settlements ultimately depend on balance, like that of many other organisms undergoing constant change. However, the descriptive and analytical efforts in archaeological studies of past and present urbanism have often focused on scale and intensity rather than balance – from enquiries into economy, social institutions and population density to architectural form.

In this paper I consider the spatial organisation of multiple urban settlements from a comparative perspective, analysing several

European and African towns that flourished in the early modern era between the 15th and 18th centuries, and which spatial organisation featured an inner partitioning into smaller units. Specifically, I focus on how natural topography such as hills and rivers, or human-built features including public buildings, were incorporated into the logic of urban spatial organisation, economic life as well as negotiations of social power. The goal of the presented arguments is not to derive a normative classification of the analysed towns, but rather to propose that to reach a sustainable balance, urban settlements in various parts of the world have employed sub-division into smaller units constituted materially within their spatial layouts.

Considering historical maps, survey layout plans and satellite photography it is argued that the complex urban systems of access points, routes, public spaces, landmarks or building material bear importance beyond material symbols and economic aspirations, and realise their full significance as components in diverse urban system. Understanding this process from the perspective of long-term global experience is relevant for debating social connotations of spatial (im)balances associated with present and future urbanism.

3 RE-CASTING THE PUBLIC BENEFIT OF URBAN ARCHAEOLOGY

Author(s): Jervis, Ben (Cardiff University, School of History, Archaeology and Religion)

Presentation Format: Oral

The rationale for undertaking archaeological research in advance of development is the 'public benefit' of heritage preservation. In this paper I propose that the concept of public benefit is under-developed in terms of the ways in which we might use archaeological data from urban excavations not only to understand the development of urban spaces but to address challenges faced by urban communities today. In particular, I will propose that the long term perspective offered by archaeological research means that our data can provide valuable contributions to debates on urban governance and the resilience of urban institutions. The implications of this contention will be explored using the example of English medieval towns and the ways in which they were able to adapt to challenges faced by their communities, including environmental change, political tension and the environmental implications of urban living. The paper will also argue that in order to maximise the public benefit of urban archaeology new and imaginative research frameworks are required, which can help to embed concern with how archaeological data can address contemporary challenges into professional practice.

4 BUILDING HISTORICAL CONSCIOUSNESS: DIGITAL ARCHAEOLOGY AND FILM-MAKING AT GOVAN OLD, SCOTLAND

Author(s): Kasten, Megan - Driscoll, Stephen (University of Glasgow)

Presentation Format: Oral

Govan Old is an ancient church site housing a large collection of early medieval sculpture that originally graced the royal burial ground of the kingdom of Strathclyde. This kingdom ceased to exist in the 12th century and gradually disappeared from popular consciousness. In time, Govan was reborn as a powerhouse of naval engineering; for a time in the 19th century, Govan was the greatest shipbuilding centre in the world. Those days of industrial greatness are also slipping into the past.

This paper explores how the archaeological resources of Govan Old can be used to rekindle local awareness of the past and rebuild community self-confidence. The two activities are part of a long-term project of building conservation, heritage creation and urban regeneration. One is a documentary film involving local school children which uses archaeology as a means of engaging them in their history and transforming their perception of their home from one of marginality to one of significance. The second element engages members of the local community in the active co-creation of 3D records and interpretations of eroding burial markers in the churchyard. The results of this portion of the project will be assessed in terms of its effectiveness in engaging younger members of the community in this more recent part of their local heritage.

198 THE ARCHAEOLOGY OF GLOBALIZATION BEYOND THE LATEST PARADIGM

Theme: Archaeological theory and methods beyond paradigms

Organisers: Autiero, Serena (VIDYA - Arti e Culture dell'Asia) - Cobb, Matthew (University of Wales Trinity Saint David)

Format: Regular session

Recent research has made clear that complex connectivities between communities go back a long time, and that the body of theories we call Globalization studies can add a lot to the understanding of the ancient world. The word globalization defines processes of increasing connectivities that unfold and the consequent social awareness of those same connectivities. The theoretical frame implemented by scholars to understand present day globalization is then a precious tool in the archaeologist's box. Studying ancient globalization implies a network approach which overcomes a territorial model centred on the ideas of domain and borders. Globalizations paved the way to transculturality, which should be understood as those cultural conditions characterized by permeation and intermingling.

The Archaeology of Globalization includes methodological issues that are valid when applied to different historical periods and areas of the globe. The purpose of this session is to provide new insights into interconnections and interactions among regions of the ancient world. Key issues include the development of complex trade networks, the spread of religions, the diffusion of global fashions, the migration of technologies, the involvement of public and private initiatives, the inset of multiculturalism, interculturalism and transculturalism. This session aims at prevent the Archaeology of Globalisation from becoming paradigmatic, and it

will highlight strength and weaknesses of the current approach. The Archaeology of Globalization is a current trend and several scholars are working on related topic around the globe even if a real dialogue is lacking. Embracing new theories, elaborating new approaches, ancient globalization can now be studied using new optics, without isolating local contexts from the global network, and adding to the theoretical debate beyond disciplines boundaries. This session will strengthen the understanding of issues and geographies that don't fit into existing divisions of academia, developing new practices, approaches, and opportunities.

ABSTRACTS

1 FROM THE FIELD TO THE GLOBE: THE ARCHAEOLOGY OF GLOBALIZATION STRENGTHS AND WEAKNESSES OF A GROWING DISCIPLINE

Author(s): Autiero, Serena (Sun Yat-sen University)

Presentation Format: Oral

The archaeology of globalization is a relatively new field, which still has a number of shortcomings which need to be addressed. In this paper I seek to examine these issues and to make the case for the archaeology of globalisation being recognized as an autonomous research field. The body of theories we call Globalisation studies can add a lot to the understanding of the ancient world. Indeed, the theoretical frame implemented by scholars to understand present day connectivities is a precious tool in the archaeologist's box. From a theoretical point of view, therefore, it is safe to consider the discipline on the right path; the biggest problems arise when dealing with case studies. Ancient Globalisation is obviously an extremely wide topic, both from a chronological and from a geographical point of view. It can only be understood if set in context, meaning that a specific case must be put in the wider frame of similar coeval phenomena; however, one cannot expect from area specialists to become omniscient once they start dealing with globalisation issues. How to solve this conundrum? How can an area specialist face globalisation? Is it possible to go past a biased approach?

The most outstanding example of bias in the archaeology of globalisation involves the recent re-opening of Classical archaeology to the study of long distance relations in Roman times, it is a fact that very recent works rely on outdated bibliography and revive a colonial approach, virtually ignoring the work done in the areas where the material originates in the last century. The archaeologist of globalisation needs to navigate into multidisciplinary and must have the humility and open-mindedness to rely on team work with area specialists. Only in this way the archaeology of globalisation can claim a better unbiased understanding of human history.

2 GLOBALISATION, THE HIGHEST STAGE OF MODERNISATION?

Author(s): Nappo, Dario (University of Naples Federico II)

Presentation Format: Oral

The use of globalisation theory to describe and analyse the ancient World has generated a rich debate. There are several issues related to the use of such term for Antiquity, first of all because of its vague and indefinite meaning even when used to describe the contemporary World.

In many ways, 'Globalisation' is a buzzword, heir to the old 'Romanisation', which has been a popular topic in scholarship for decades in the 20th century. Romanisation is now a long-dismissed concept, for its intellectual laziness and ideological implications. Globalisation theory provides scholars with a big opportunity, to start afresh with a new intellectual and theoretical tool that might provide them with a better comprehension of Antiquity. The first obvious benefit is the fact that 'Globalisation', unlike 'Romanisation' is a more neutral word, with fewer ideological implications. Yet, this might also become a methodological weakness, as long as Globalisation is only a politically correct version of Romanisation.

Such a methodological concern has a parallel in the wider context of theories and models applied to the study of Antiquity. Since the last decade of the nineteenth century, models and theories in history progressively gave way to cliometrics and quantification analyses, tools which, while allowing the processing of large datasets, usually failed to provide a meaningful interpretation for them.

This paper will concentrate on some economic features of ancient globalisation. Its aim is to add to the theoretical debate on Globalisation, investigating the difference between ancient and modern globalisation, starting from the assumption that globalisation is the final product of change in any given society, rather than the agent of such change. Assuming this point of view, Globalisation theory becomes, in my view, a very powerful tool to accomplish a fuller comprehension of ancient civilisations and of the economic dynamics of premodern societies.

3 ARCHAEOLOGY OF GLOBALIZATION: A RETROSPECTIVE VIEW OF THE INDIAN OCEAN PAST AND IMPLICATIONS FOR THE PRESENT

Author(s): Gupta, Sunil (Allahabad Museum)

Presentation Format: Oral

The present day phenomenon which we call 'globalization', and which we understand to be primarily rooted in a powerful economic dynamic, is manifested the world over through the spread of new techno-cultural standards and certain uniformities in business

practices. The socio-economic and cultural issues thrown up by the globalization phenomenon have been explained by social scientists mostly on the basis of causal factors rooted in present time. In his book, *Runaway World: How Globalization is Reshaping our Lives*, Anthony Giddens argues that it is the information revolution which is transforming the world. It is my submission that the phenomenon of globalization also needs to be understood in deep time perspective. Therefore the role of historians and archaeologists. I have recently argued that the first three centuries CE are witness to the economic integration of the Indian Ocean world in a way which was unprecedented. Never before had so many polities competed for fruits of international trade as it happened in the early centuries CE. Never before had so many trade ports opened and so many goods circulated. Never before had so many crafting and trading communities become involved in the exchange networks from the Red Sea to the South China Sea. The Indian Ocean world came closest to experiencing the phenomenon we call globalization today. I have also argued that the globalization of the ancient Indian Ocean world between 1st-3rd centuries CE was building up through the preceding centuries. And, of course, we see the impact of this globalization in the creation of new techno-cultural traditions, migrations and art in the centuries after. Therefore, in my proposed paper, I will try to establish – through specific highlights – that a retrospective view of the Indian Ocean past may help us negotiate the rapid undercurrents of present day globalization.

4 GALVANISING GLOBAL NETWORKS: THE USE AND SIGNIFICANCE OF INDIAN OCEAN GOODS IN PTOLEMAIC EGYPT AND THE PRE-ROMAN MEDITERRANEAN

Author(s): Wilkinson, Troy (University of Wales Trinity Saint David)

Presentation Format: Oral

An increasing number of modern scholars have sought to explore the financial and social impact on the Roman world of goods imported via the Indian Ocean trade network between the 1st-3rd centuries AD. Within this body of scholarship there is a growing and arguably accurate tendency to conceptualise Rome as the centre of only one region or ‘province’ of a more ‘global’ economy (Fitzpatrick 2011). By contrast, modern scholarship has yet to fully explore the significance of the Ptolemaic era activity in the Red Sea and instead has tended to assume that trade during this time was small-scale and relatively limited in social impact both within Egypt and the wider Mediterranean world.

Therefore, this paper will, by utilising a range of source material (particularly inscriptions, literature and papyri), argue that the goods imported into Egypt via the Indian Ocean trade, while quantitatively on a smaller scale than during the Roman period, made a lasting impression both on Ptolemaic society and the wider Mediterranean. Particular attention will be given to the diffusion of these Indian Ocean goods and the range of purposes to which they were put. A more in-depth exploration of this earlier Ptolemaic activity will allow for the subsequent, increasingly “globalised” integration of the Roman world into wider Afro-Eurasian networks to be better contextualised.

5 MEDITERRANEAN GOODS IN AN INDIAN CONTEXT: THE USE OF TRANSCULTURAL THEORY FOR THE STUDY OF THE ANCIENT INDIAN OCEAN WORLD

Author(s): Cobb, Matthew (University of Wales Trinity Saint David)

Presentation Format: Oral

The study of the ancient Indian Ocean world has received increased interest in the last few decades thanks to the increasing volume of new archaeological and textual information unearthed at various international sites. It is rightly the case that a great deal of attention has been directed to what this evidence can tell us about the operation of the ports, the trade’s organisation and funding, the types of commodities exchanged, as well as levels of “state” interest in this activity. More recently, an increased focus on the cultural dynamics of this exchange and its consequent impacts on intellectual, religious and social developments within various polities offers a valuable additional avenue with which to assess the significance of global interconnections in antiquity.

It is argued in this paper that one useful tool for the historian and archaeologist interested in these Indian Ocean interconnections is transcultural theory. Principally by considering the impact of a new geographical and cultural context on how items of exchange were understood, appreciated and became re-contextualised. This paper focuses on the appearance of goods from the Mediterranean world in various areas in South Asia (and parts of Central Asia) during the early centuries CE. The array and distribution of different types of finds across the Indian Subcontinent is such that an exhaustive treatment is not possible here. Instead a few case studies will be examined, specifically: 1) the importation and consumption of Mediterranean wine in India; and 2) the use and adaptation of Roman aurei and denarii in an Indian context. The aim of the paper is to look beyond the perception of these items as mere prestige objects, items of consumption or stores of value, and consider their potential social and ritual significance in their new context.

6 THE INDIAN FIGURINE FROM POMPEII AS AN EMBLEM OF EAST-WEST TRADE IN THE EARLY ROMAN IMPERIAL ERA

Author(s): Weinstein, Laura (John Cabot University)

Presentation Format: Oral

When Amedeo Maiuri discovered an ivory statuette in the ruins of Pompeii in 1938, scholars already knew from the textual sources that trade had existed between Rome and Arabia, India, and with India as a conduit, China. Exchange between India and Rome flourished for centuries, especially during the Roman Imperial period, but the droves of spices, cloth, wood and gems that the an-

cient writers and the Periplus Maris Erythraei reported had long vanished or become impossible to provenance. Some luxurious ivory ornaments had been found, but none pinpointed Indian craftsmanship. Instead this 24 cm tall female figure is the first - and to date only - object securely traceable to India prior to AD 79.

Perhaps because until recently most scholars have been expert in either Indian or Greco-Roman art, the statuette has been under-studied and under-published. Archaeological excavations in India (e.g. Arikamedu, Kolhapur, Pattanam, etc) have highlighted Roman exports to India. However this paper attempts to rectify the misperception that lack of artifacts in the West signifies lack of activity, creating a fuller picture of this unusual object, the embodiment of globalization, and rare only by default.

This paper attempts to reconstruct the path from creator to end user in a cosmopolitan world, imagining the 6000 km journey the statuette might have made from southern India to Pompeii, updating iconography and function debates, and putting the find spot debate to rest. Moreover this paper highlights specific artifacts in the storerooms of the National Archaeological Museum of Naples as well as interesting footnotes in previously published papers which could benefit from fresh study in light of emerging interests in globalization.

By delving deeper than previous scholars into just one object, this paper opens the possibility for further material evidence of the active trade across seas and oceans, two millennia ago.

7 BRONZIZATION, THE GLOBALISATION OF BRONZE AGE IN AFRO-EURASIA

Author(s): Daroczi, Tibor (Department of Archeology and Heritage Studies, School of Culture and Society, Aarhus University)

Presentation Format: Oral

The second millennium BCE is a time in human history when the archaeological record, both in terms of travelled finds and ideas, reflects a networking of unprecedented intensity and velocity. This phenomenon of heightened networking and interconnectivity is recognised as one of the earliest manifestations of globalisation, occurring in Afro-Eurasia during the Bronze Age, and is tentatively termed bronzization. The engine of any globalisation is a transculture, which emerges from a broad network and permeates regional groups, thus creating at these entry points the contact zone, a social space that merges the global with the local, but also gives birth to autoethnography and transculturation. Furthermore, the transculture has a democratising effect, in the sense that previously valued goods and ideas, to which access was restrictive and controlled, become available to a large group of people. The result is a cascade effect on networking and interconnections with a myriad of directionalities, choke points and dead ends as well. From a methodological point of view, a mind-set that allows for the recognition and research of such a complex web of contacts is *histoire croisée*, which from its conceptions considers more than just single, directional dependencies and bi-directional flows.

The transculture of this age is bronze. The desire to acquire this good as raw material (copper and tin), semi-finished product (ingot) or finished goods, echoes through all corners of Afro-Eurasia. These in turn prompt the circulation of goods, symbols, styles and technologies, but also of people and views of their world and lives. Several find categories and lifestyles are already highlighted as clear indicators of such an interconnectivity; amber, vitreous materials, ceremonial hearths, horses, wagon/chariots and afferent harnesses, warriorhood and warfare, Bronze Age specific womanhood are just a few of the clear beacons that convey the occurrence of bronzization.

8 GLOBALIZATION, POWER, AND RESISTANCE: THE LATE BRONZE AGE IN THE NORTHERN LEVANT

Author(s): Montesanto, Mariacarmela (Durham University)

Presentation Format: Oral

The concept of globalisation is based on the idea that the world is seen as one place, however, it does not imply a unified society and culture. Studies of globalisation often focus on a broad geographical range, but globalisation can be an effective tool in understanding local interpretations. For instance, shared practices are not identically replicated everywhere and increased contact can provoke resistance. Engagement at a global level can lead to a clash of cultures that results in attempt to re-define boundaries between the different groups.

The Late Bronze Age in the Northern Levant is often considered as the "International Age", however, studies often draw attention on the shared practices while neglecting the differences. This paper will present the work in progress results of a case study dealing with the interactions between the Late Bronze Age empires and the local population in the Northern Levant. In particular, this paper will focus on the analysis of the Late Bronze Age pottery from the site of Alalakh/Tell Atchana (Turkey) to understand the impact that the Mitannian and Hittite empires had on ceramic use and production on the site and to explain material change in the Northern Levant during the Late Bronze Age.

The study will engage with changes in the pottery typology, production and standardization as well as changes in social habits and behaviours within the balance between global and local networks.

9 BRONZE AGE GLOBALISATION AND LATER JŌMON SOCIAL CHANGE

Author(s): Hudson, Mark (Max Planck Institute for the Science of Human History) - Bausch, Ilona (Kokugakuin University)

Presentation Format: Oral

From northern China, millet agriculture spread to Korea and the Maritime Russian Far East by 3500-2700 BC. While the expansion of agricultural societies across the Sea of Japan did not occur until around 900 BC, the intervening period saw major transfor-

mations in the Japanese archipelago. The cultural florescence of Middle Jōmon central Honshu underwent a collapse and reorganization into more decentralised settlements. Mobility increased as Late Jōmon influences spread from eastern into western Japan, and populations expanded to offshore islands such as Okinawa and the Kurils. In Kyushu and other parts of western Japan, the eastern Jōmon expansion was associated with the cultivation of adzuki and soybeans but there is no evidence for the introduction of cereal crops at this time. Here, we discuss connections between the Eurasian mainland and the Japanese Islands ca. 3500 to 900 BC. Our analysis concludes that the transformations in Jōmon society during this period were at least in part a response to contacts with Eurasian Bronze Age cultures. Although prehistoric Japan was one of the most isolated regions of Eurasia, we conclude that the historical evolution of societies in the Japanese archipelago after the third millennium BC was linked with processes of Bronze Age globalisation.

10 SOME THEORETICAL APPROACHES TO STUDYING GENDER IN GANDHARA ART

Author(s): Lakshminarayanan, Ashwini (University of Rome La Sapienza)

Presentation Format: Oral

The Northwestern corner of the Indian Subcontinent – where the School of Gandhara Art arose – is a crucial crossroad in the frame of Early Historic Globalisation. Gandharan sculptures are a major source for analysing fundamental questions regarding gendered depictions in the subcontinent. Due to the multicultural environment in Gandhara (from Hellenistic, Persian, Roman and local cultures), there is an easy tendency to undervalue the contributions of non-western cultures to its art and to over-emphasize the role of literary sources as a key tool to understand gender relations in ancient Gandhara.

The foremost view on gender relations – “male dominance over female” – in Gandhara (and ancient India) has been derived mainly from literary sources. Images of female figures were used to relate to the themes discussed in literary texts, but so far they did not deserve independent study. However narrative scenes also depict powerful women, subversive femininity, female sexuality and compromised masculinity through a range of characters. Although these images are not a direct mirror reflection of society, their symbolic meaning reveals “common ideologies” embedded in them regarding gender relations.

My aim in this paper is to provide an overview of theoretical approaches to understand gender relations as depicted in Gandhara art from the 1st to the 4th century A.D. During this period, Buddhist art integrated pre-existing Hindu views on gender relations while simultaneously adapting to the multicultural community that is vital for its survival. This was a direct consequence of ancient globalisation. Using postmodern theoretical approaches in the study of Gandhara art within its context, this paper will attempt to understand the multiple ideological underpinnings in the interpretation of visual arts and the impact of a multicultural environment on the artistic production in order to develop a research pattern to study gender in Gandhara art.

11 DEVELOPMENT OF EARLY CHRISTIAN ARCHITECTURE: KOSOVO CASE

Author(s): Hoxha, Zana (Institute of Albanology)

Presentation Format: Oral

This paper focuses on Early Christian architecture in the territory of Kosovo in a global context. Kosovo lies on the southeastern part of Europe, precisely on the Balkan Peninsula, putting the country at a favorable geographic and geopolitical position. Consequently, the process of Christianization reached this region relatively early. The written sources confirm that the earliest traces of Christianity are the first martyrdoms, Florus and Laurus, in the roman city of Ulpiana in the 2nd century AD, while the first traces in architecture from Ulpiana date from the 4th century AD. The objective of this paper is to present concrete examples of Christian architecture in Kosovo under the lens of globalization. Through comparative analysis of the design method and construction techniques of these buildings, we can observe how Christian architecture was subject to globalization process of this period. Concluding, through these examples we can acquire a greater understanding on the ways that the global trends of the Early Medieval period in architecture were adapted to local conditions in form of new shapes and styles in the beginning and how the ambitions of the emperor Justinian affected the architecture in quantity and quality centuries later.

12 POTTERY DECORATION AS RESISTANCE: THE EFFECTS OF EUROCENTRIC CAPITALISM IN ENSLAVED PRODUCTION

Author(s): Manfrini, Marcelo (University of São Paulo)

Presentation Format: Oral

When the Portuguese first arrived in South America, massive changes started to occur when their culture clashed with the indigenous natives that already inhabited the continent. The introduction of the logic of mercantilism, of currency, and European styles, paved the way for new relations of power that up to that point did not exist in Brazil. These new demands and concepts created significant changes in the material culture encountered in the region.

The Great Iberian Navigations was the first time that global economic transformations started to occur in the Americas. And the introduction of mercantile enterprises, with exploration of a whole new continent within a global scale economy produced massive changes in the way the world functioned, and an even greater impact in native societies that already inhabited these lands.

In this paper we will address the colonial pottery unearthed in the city of São Paulo, that dates back to the first century of occupation in the region (mid 16th to mid 17th c.), and show how the pottery production in the city developed a unique style, with European shapes and techniques, but with indigenous forms of decoration.

We will argue in favor of the theory that these styles of decoration (incisions, grooves and engobes) are forms of indigenous cultural resistance in a European colonial system that thrived on native slave labour. These forms of resistance would once again occur with the introduction of enslaved African labour, and would be persistent during the whole colonial experience. Therefore, we will be able to discuss some of the impacts of globalization and European influences on traditional native ceramic production.

199 RETHINKING THE INTERPRETATION OF VERTICAL PAST LAND USE ON MOUNTAIN ENVIRONMENTS

Theme: Archaeology of mountainous landscapes

Organisers: Röpke, Astrid (Institut für Ur- und Frühgeschichte, Universität zu Köln) - Carrer, Francesco (Newcastle University, McCord Centre for Historic and Cultural Landscape) - Visentin, Davide (Dipartimento di Studi Umanistici, University of Ferrara)

Format: Regular session

Mountain regions are characterized by the altitudinal zonation of their vegetation, mainly depending on climate, relief, slope exposition and soil. Similar vegetation belts (subalpine, alpine, montane) can be found on various mountain ranges but at differing altitudes. Since prehistoric times such vertical structure has stimulated the development of specific land use strategies, which in turn led to the gradual evolution of typical mountain cultural landscapes.

In the last decades an increasing number of interdisciplinary projects provided a better understanding of human-environment interaction in the mountains, shedding a new light on the progressive transition from game-hunting to seasonal pastoralism starting from the Neolithic. However, the interpretation of past subsistence practice in the mountains mainly relies on the analogy with historical practices carried out in the same environments or prehistoric practices documented in other environments. More holistic studies, encompassing different altitudinal ranges and using multi-proxy approaches, are necessary to overcome this interpretative bias and develop new theories and hypothesis on human occupation of mountain environments.

In this session we seek papers combining data from local palaeoecological archives such as soils and/or near-site pollen archives, macrobotanical remains, archaeozoology, GIS and archaeology to analyse the array of activities undertaken at different altitudes in the mountains: hunting, pastoralism, mining, arable farming and gardening.

Contributors are encouraged to present case studies or regional synthesis related to vertical land use on mountain environments and more specifically to the interactions between different altitude belts and their role in shaping the current cultural landscape of mountain regions.

ABSTRACTS

1 BETWEEN HIGHLANDS AND VALLEY BOTTOMS. DEBATING THE ROLE OF MESOLITHIC MID-ALTITUDE SITES IN THE SOUTH-EASTERN ALPS

Author(s): Visentin, Davide - Fontana, Federica (Università degli Studi di Ferrara)

Presentation Format: Oral

The South-Eastern Alps represent one of the richest areas in Europe for its Mesolithic record. In fact, some hundreds of sites and find-spots spanning from the main valley bottoms to the Dolomite highlands are currently known. As regards the former, these are mostly represented by rock-sheltered sites that were interpreted as mid-to-long-term residential settlements although recent studies revealed a high specialisation degree of at least part of them. The highest density of sites can be found in the uplands. These are mostly interpretable as hunting-oriented camps and stands clustered along the tree-line zone (1800 - 2300 m asl). As pointed out in previous studies, such location seems to correspond to a deliberate strategy aimed at the exploitation of the Alpine forest-grassland ecotone. Evidence of human presence in-between these two altitudinal zones, on the other hand, is quite scarce. In this paper, currently available data on the occupation of midland territories will be questioned in order to assess how these areas could be exploited by the last European hunter-gatherer groups and infer their role in the settlement strategies of the Alpine region.

2 CONNECTING LANDSCAPES. RECENT ARCHAEOLOGICAL FINDS ON THE LÖTSCHENPASS (2676 MASL, SWITZERLAND) IN THEIR REGIONAL CONTEXT

Author(s): Gubler, Regula (Archaeological Service of Canton Bern)

Presentation Format: Oral

Several high alpine passes link the Swiss plateau, with its rich archaeological evidence for prehistoric settlement along lake-shores, with the Rhône valley in the Valais to the south and, by extension with northern Italy. The Lötschenpass (2676 masl) has recently provided the latest evidence of prehistoric people crossing the Berne Alps.

Besides a considerable number of artefacts dating to various periods, an assemblage dating to the Early Bronze Age and melting out of an ice patch was excavated in 2012 and 2017. It comprises of several bow fragments, arrowheads and arrows, a wooden splint box, a birch bark object and a large number of leather, wood and other organic fragments. In the course of the excavation soil samples were taken as well.

The investigation and conservation of the assemblage has started and this contribution intends to present the first results as well as setting them in a regional context. The focus will lie on the existing corpus of palynological data, the - little known - Bronze

Age settlement pattern both north and south of the pass and what can be inferred from the pass finds and samples about landscape use both in the valley bottom and the high alpine zone.

3 STONES IN MOUNTAIN SOILS AS INDICATOR FOR ANTHROPOGENIC ACTIVITY (MONTANFON VALLEY, AUSTRIA)

Author(s): Röpke, Astrid (Ur- und Frühgeschichte, Universität zu Köln) - Klopfer, Rudolph - Krause, Rüdiger (Vor- und Frühgeschichte, Goethe Universität Frankfurt)

Presentation Format: Oral

Bartholomäberg (900 - 2000 m a.s.l., Montafon Valley, Austria) is vertically subdivided into a settlement, a former mining and a pasture zone. However, the spatial extent of these different land use zones has changed through time as indicated by geoarchaeological, archaeobotanical and archaeological results. In good accordance with all available data the settlement activity and land use started in the later Early Bronze Age (18/17th cent. BC).

In this study we focus on the origin of stones in soils from the different land use zones. These montane to subalpine soils are comparatively thick reaching up to two meters in foot slope position. Most of them have been modified by human activity consisting of several colluvial layers. The results of our study indicate a considerably higher skeletal contents in soils of the settlement zone (900-1300 m a.s.l.) than in the pasture zone (1400 -2000 m a.s.l.). Comprehensively, concentrations of stones are located in the area of prehistoric settlements sites shown as walls, stone plasters, fire places, burnt pits etc, but they are also frequent in the surroundings evidencing further settlement activity nearby. In contrast, the soils under pastures seem to be almost stone-free. This distinctly lower skeleton content could derive from more easily weathered parent rock (clay, marl, mica schists), but again human impact can not be ruled out. This could also be a phenomenon related to pasture cleaning and maintenance. Until the middle of the 20th century so-called „Almputzer“ regularly removed bushes, repaired pathways and picked up stones to prevent damage of the grass cover. In Bartholomäberg the presence of stone heaps (Steinlesehäufen) might point to such former cleaning activities in the pasture zone.

4 ARCHAEOLOGICAL FEATURES, SITE CATCHMENTS AND SEASONAL CYCLES – MULTI-PROXY APPROACH TO PREHISTORIC FOREST SUBSISTENCE ECONOMY IN THE LEVENTINA VALLEY (TICINO)

Author(s): Della Casa, Philippe - Jacquat, Christiane (University of Zurich)

Presentation Format: Oral

The Bronze and Iron Age settlement of Airolo-Madrano TI was excavated during a larger project on prehistoric Alpine economy in the years 2004–08 (cf. Della Casa, ZSA 12, 2018). It is situated at an altitude of 1150 masl on a hillock above the Leventina valley floor, in an area situated at the climatic limits of Alpine crop cultivation. The excavations yielded abundant material finds and biological macroremains, in particular grains, chaff and seeds of cereals (*Hordeum*, *Triticum*, *Panicum*), pulses (*Pisum*, *Vicia*) and oily plants (*Linum*), as well as of wild plants with nutritional value, and animal bones. An all-year local subsistence economy can be postulated, completed by the use of the abundant forests and subalpine pastures in the upper valley. The Airolo-Madrano site catchment has been modeled using environmental parameters in GIS.

In the archaeological record, a number of stone-lined firing pits bordered by rows of pales stand out as conspicuous features of subsistence/economic activities. Besides large amounts of cracked stones and charcoal, these pits always contain conifer needles, remains of cereals and other cultivated or gathered plants, burnt animal bones and ceramic shards, and are thus interpreted as pit ovens (similar to “fours polynésiens”). Such features are known from many Alpine and peri-Alpine sites of the younger prehistoric periods.

Maintaining an all-year settlement in a remote mountain area such as the Leventina valley requires a great amount of effort in the production, conservation and storage of (mostly seasonal) food products, in particular during wintertime. The phenomenon of pit ovens can be discussed against the background of seasonal cycles, agricultural produce, food conservation techniques (kiln drying, smoking, roasting) and nutritional needs within a labor-intensive forest subsistence economy as inferred for the Airolo-Madrano village.

5 THE EFFECTS OF THE EVOLUTION OF PASTORALISM ON HIGH-ALTITUDE LANDSCAPES AND ENVIRONMENTS: A CASE-STUDY FROM VAL DI SOLE (ITALIAN ALPS)

Author(s): Carrer, Francesco (Newcastle University) - Angelucci, Diego (Università di Trento)

Presentation Format: Oral

High altitudes are often regarded as pristine, marginally modified by human activities. The main practice traditionally carried out at high altitude is pastoralism, perceived as a very conservative, extensive and low-impact practice: a strategy that is perfectly adapted to the environment and that does not transform the essential character of montane landscapes. Archaeology and palaeoecology have long dismissed this common perception, demonstrating that pastoralism have significantly contributed to shaping high mountains since the Neolithic. However, pastoral practices transform over time, and their evolution acts as a critical driving force for land-use and land-cover change. Therefore, the impact of pastoralism on ecosystems and landscapes should not be perceived as a homogeneous process (exclusively related to the increasing or decreasing intensity of animal husbandry), but as a “punctuated equilibrium”. This concept, borrowed from evolutionary biology, describes systems that go through a series of transformative events (‘tipping points’), which tear the deep structure of these systems and enable the formation of new

ones. In this paper, we will use the “punctuated equilibrium” paradigm to interpret archaeological, historical and palaeoenvironmental evidence from the high altitude areas of Val Molinac and Val Poré, in Val di Sole (Italian Alps). This approach will lead us to investigate how the profound transformations of pastoral strategies occurred in the 15th and early-19th and mid-20th century, have transformed the impact of livestock-grazing on high-altitude environments and cultural landscapes. The inferences provided for the historical period will be used to rethink human-environment interaction at high-altitude in the late-prehistoric period in the same study-area. The outcomes of this study will improve our understanding of the impact of pastoralism on the ecology and historic character of the Alps.

6 THE SHEEP REMAINS OF THE GIÉTROZ CHASM (VALAIS, SWITZERLAND): UNEXPECTED EVIDENCE OF ALPINE GRASSLAND EXPLOITATION DURING THE LATE IRON AGE

Author(s): Reynaud Savioz, Nicole (Bureau ARIA SA, Sion)

Presentation Format: Oral

The radiocarbon dating of sheep remains found in a chasm located at 2,200 m a.s.l. in the Swiss Western Alps sheds new light on the issue of protohistoric summer pasture and land use in an alpine environment.

The Giétroz Devant chasm (located in the small valley of Susanfe in the Chablais Alps), discovered in summer 2017, contained abundant and particularly well preserved faunal remains. The bones were identified as belonging to ibex, chamois and sheep. About fifty wild and domestic ungulates were accidentally trapped in a fault of the karst system. Radiocarbon dating shows that this kind of trapping happened from at least 6500 BC until 50 BC. All the sheep samples (five individuals) can be dated to 200-50 BC. These results provide evidence, for the first time, that the Celtic tribe of the Nantuates brought herds to alpine summer pastures. The age and sex distribution of these sheep yields precious indications for our understanding of Late Iron Age pastoralism. This presentation also aims to incorporate these results in the archaeological context of the Upper Rhône Valley.

7 PRODUCTION, CONSUMPTION AND PROVENANCE OF MOUNTAIN TIMBER SINCE THE MIDDLE AGES : A DENDROARCHAEOLOGICAL RESEARCH FROM ALPS TO PYRENEES

Author(s): Labbas, Vincent (TRACES, UMR 5608, University of Toulouse)

Presentation Format: Oral

This paper aims to present the first results of an ongoing postdoctoral research at the University of Toulouse. This research project focuses on production and consumption and the provenance of mountain timber since Middle Ages.

The main approaches are dendrochronology and building archaeology. Written record and soil archives are also considered in this research. The material acquired this year will open a dendro-isotopic study. Garonne basin, between northern Pyrenees and Toulouse area have been chosen as laboratory.

The first results were obtained during my PhD thesis in the Mercantour massif (South French Alps). Mountain barns study reveals different forest exploitation basins within the same building. Furthermore, forest plots survey shows an exploitation along the elevational gradient. A first dendrochronological experiment was conducted on an altitudinal gradient in the context of the archaeological excavation of a recent mine in the Alps (18th – 20th centuries). This experiment revealed similarities of larch (*Larix Decidua* Mill.) groups according to their altitude (between 1500 and 2200 m.).

In the Pyrenees, the first results show a differential use of forest resources according to the hydrographic networks. Silver Fir (*Abies alba* Mill.) mostly used in Toulouse, is a mountain species. However, it's an essence that does not appear to be used in the various mountain areas upstream of Toulouse.

The joint approach of the different sources (materials, dendrometrics, archivistics) will enable us to learn more about trade, zones of influence but also changes in forestry practices and construction in the mountains and in the plains.

8 THE SOCIAL CONSTRUCTION OF LANDSCAPE IN CENTRAL PYRENEES. CHANGES IN STRUCTURES AND SETTLEMENT PATTERNS OF ARCHAEOLOGICAL SITES IN AIGÜESTORTES

Author(s): Garcia Casas, David - Gassiot Ballbè, Ermengol (Universitat Autònoma de Barcelona. Departament de Prehistòria)

Presentation Format: Oral

The National Park of Aigüestortes i Estany de Sant Maurici is located in the Central Pyrenees (Spain), in a high-altitude mountain zone. During the last 15 years, the Grup d'Arqueologia de l'Alta Muntanya research group from Universitat Autònoma de Barcelona has carried out archaeological surveys and test excavations that provides a large and quite continuous sequence of human occupation from the Mesolithic to the 20th century. In this area is possible to observe signs of seasonal herding management that are quite different from the extensive transhumance recorded by the ethnographic sources. Furthermore, it is possible to observe other activities such as agriculture or coal yard.

This paper presents the results of an investigation that involves the architectural characteristics of open-air structures, the ethnoarchaeological modelling of traditional land uses and use Geographical Information Systems to explore spatial relationship between the archaeological sites and its surrounding environment and other signs of human occupation in the surrounding areas. In addition, the palynological data obtained in the territory has been integrated to analyse the social construction of mountain landscape considering human and natural insights in a long-term perspective, from Prehistory to Modern Age.

The results of these investigations show how human groups inhabited the high mountain environments and their relationship

with valley floors. Moreover, the conclusions invite to discuss the connection between historical evolution in regional scale and the changes that archaeology permit to observe in mountain contexts.

9 LAND-USE AND HUMAN OCCUPATION IN TER HIGH MOUNTAIN VALLEYS (EASTERN PYRENEES, SPAIN): A LONG-TERM AND MULTIDISCIPLINARY LANDSCAPE RESEARCH

Author(s): Palet, Josep Maria (Institut Català d'Arqueologia Clàssica) - Garcia, Arnau (McDonald Institute for Archaeological research. University of Cambridge) - Polonio, Tania - Colominas, Lidia - Orengo, Hèctor Aleix (GIAP. Institut Català d'Arqueologia Clàssica) - Pescini, Valentina - Fossati, Massimiliano (Laboratorio di Archeologia e Storia Ambientale - LASA. Dipartimento di Antichità, Filosofia, Storia e Geografia - DAFIST. Università degli Studi di Genova)

Presentation Format: Oral

Since 2010, an integrated landscape research has been developed in Ter high mountain valleys (Eastern Pyrenees), with the aim of studying the long-term landscape change of these Mediterranean high-mountain environments. This programme involved extensive surveying, GIS, excavation and radiocarbon dating of archaeological structures and the integration of bioarchaeological and palaeoenvironmental data. The project has been thus designed from a landscape archaeology perspective in order to treat these data as cultural proxies. The results underline the importance of livestock management in these high-mountain areas which were well-integrated in extra-regional trade networks from the Neolithic onwards.

The first landscape change occurred in the valleys since the Middle Neolithic-Late Neolithic transition (~3600 cal BC) until the Early Bronze age (~ 1600 cal BC) when the alpine grassland belt expanded and human settlements have been documented at ca. 2,500 m a.s.l. Archaeobiological record (charcoal analyses) and micromorphology give new insights to characterize past land-use practices and landscape change which included fire-driven forest openings and grazing activities. Roman times report an important period in livestock expansion, with an especial intensity from the 2nd - 3rd centuries and during Late Antiquity. In this period, these valleys become integrated in the Roman economic sphere. Specialised pastoral practices for regional and extra regional distribution are also attested. Landscape dynamics show a new expansion from the high middle Ages (9th-10th c.), with the reuse of Roman structures and the construction of new ones clearly more specialized (cheese production). This phase is well attested in the paleoenvironmental and archaeobiological record. Finally, data attests a new phase of pastoralism expansion from the 14th-15th c. to modern and contemporary periods.

10 THE ENVIRONMENTAL HISTORY OF SUDETEN MOUNTAINS IN THE EARLY MIDDLE AGES

Author(s): Lisowska, Ewa - Malkiewicz, Małgorzata (Uniwersytet Wrocławski) - Kałużna-Czaplińska, Joanna (Politechnika Łódzka) - Sady, Agata (Muzeum Śląskie w Katowicach) - Rodak, Sylwia (Uniwersytet Wrocławski)

Presentation Format: Oral

This paper presents preliminary results of the environmental project conducted in Sudeten in 2016-2019 (nr 2aH 15 0283 83). During the excavation of Early Middle Ages sites samples were taken for palynology, gas chromatography and for microscopic examination of plant remains. Palynological studies, in addition to the reconstruction of the character of the nearest environment, indicated the possibility of collecting plants for the purposes of herbal medicine (accumulation of pollen within individual features). Such accumulation was observed in the interior of one of the residential buildings, where a high amount of pollen of dandelion, *lapulla squarrosa*, asteraceae and hawkweed was found. In the second case, a very high amount of lime pollen was found, which could be used for the production of infusions. Furthermore pollen analyses were used to indicate the marginal role of agriculture in the mountainous areas and the existence of large tracts of meadows within forest clusters. Additionally gas chromatography tests, based on the samples taken from pottery, were applied to determine dietary components as well as to identify the composition of tar production (mostly on the vegetable basis). The presented analyses allow the reconstruction of the human shaped Sudeten mountain ecosystem in the Early Middle Ages.

11 BIOLOGICAL MEMORY OF SOILS AND OCCUPATION LAYERS OF ARCHAEOLOGICAL SITES: A CASE STUDY IN SUBMOUNTAIN ZONE OF NORTH CAUCASUS

Author(s): Chernysheva, Elena (Institute of Physicochemical and Biological Problems in Soil Science FICPSCBI RAS)

Presentation Format: Oral

Applied to archaeological sites, the essence of biological memory consists in the following. Human activity is accompanied by the input of specific organic materials into the soil. These organic materials are subsequently lost due to their complete mineralization by soil microorganisms. Despite the fact that organic substances had been decomposed, the information about their income may store in changes of soil microbial communities and enzyme activity and these changes can be preserved up to now. Soils and occupation layers of settlements represent a natural experiment with well-known place, time, and nature of anthropogenic activity. Their study allows evaluating the peculiarities of transformation of soil microbial community.

The aim of this work was to study the effect of farming practice on soil properties and evaluate the peculiarities of changes of microbiological and biochemical soil properties.

Objects of studies were: (i) agriculture terraces in mountain Dagestan (North-Eastern Caucasus) (1st millennium BC - 1st millennium AD); (ii) soils around archaeological sites (AD 200-800) and (iii) ancient stone corrals (1400-1200 BC) that are situated in the Kislovodsk basin (North Caucasus, Russia).

Farming practice with long-term manuring in the past had led to significant changes in soil microbiological properties. Application of cattle manure had led to a change in microbial biomass and enzyme activity. High levels of enzyme activity (phosphatase, urease, cellulase, and chitinase) and abundance of thermophilic microorganisms allowed us to reveal places of cattle keeping and boundaries of medieval agriculture fields.

Thus, our work shows that the information about entering into the soil organic substrate can be stored in soil biological memory for about 3000 years. However, the time of keeping the information about human activity is seem to be much longer.

Financial Support: This study was funded by the Russian Science Foundation (grant no. 17-18-01406).

12 19TH CENTURY TRANSFORMATION OF MOUNTAIN LANDSCAPE IN THE CZECH REPUBLIC: CASE STUDY OF ŠUMAVA MOUNTAINS

Author(s): Blažková, Tereza (Charles University, Faculty of Humanities; Labrys, o.p.s.) - Kucharik, Milan (Labrys, o.p.s.)

Presentation Format: Oral

Bohemia region in the central part of the Czech Republic is bordered by mountains (Šumava Mountains on SW). These mountains were rarely populated until the early 19th century. So called Medieval colonization of Bohemia didn't reach such high altitudes as the woodcutters colonization at the turn of 18th and 19th centuries.

The contribution deals with the Šumava Mountains in the SW Bohemia and the phenomenon of woodcutters colonization in the 19th century, which was induced by the industrialization of Bohemia. The mountains were a „storehouse“ of fire wood for low-land factories. Fire wood was primarily needed for industrial enterprises in Prague.

Thanks to this colonization so far only very little man-affected landscape had undergone great changes. We can still see the influence of 19th century woodcutters activities in the landscape today. It affected not only composition of tree species, but also entire ecosystems of a large area. The case study focuses on landscape changes, new settlement patterns and water works (incl. canals) for timber navigation which shaped the current cultural landscape of this mountain region.

13 WHAT PASTORAL NOMADS LEFT BEHIND: GIS & SATELLITE REMOTE SENSING COMBINED WITH GEOARCHAEOLOGICAL FIELDWORK IN THE HIGH ATLAS MOUNTAINS, MOROCCO

Author(s): Zickel, Mirijam (Archaeobotany, Department of Prehistoric Archaeology, University of Cologne; GIS & Remote Sensing, Institute of Geography, University of Cologne) - Röpke, Astrid (Archaeobotany, Department of Prehistoric Archaeology, University of Cologne) - Bareth, Georg (GIS & Remote Sensing, Institute of Geography, University of Cologne) - Reitmaier, Thomas (Institute of Archaeology, University of Zurich)

Presentation Format: Oral

Geoarchaeological investigations of pastoral livelihood structures in high mountain regions not only pose challenges in the field but can also imply issues in remote sensing. The main objective of the study is a scientific insight into pastoral land use strategies in the semi-arid high mountains, particularly for archaeological purposes. In Azilal, a district of Morocco in the High Atlas, the Ait Atta pastoralists used, and to some extent still use, the summer pastures to sustain their pastoral mode of life as they did for centuries. In combination with the results of geoarchaeological prospections carried out in the study area in the year 2017, the application of GIS and remote sensing techniques proved to be a valuable part of the survey. Taken the extreme mountainous terrain conditions into account, the use of standardized radiometric indices, e.g. the NDVI Normalized difference vegetation index, combined with a semi-automated structure detection, was a preferable toolkit to conduct a land use pattern analysis. The results give a scientific view on past and present ways of pastoral land use and constitute the basis of future GIS/remote sensing supported geoarchaeological research in the study area.

14 ALPINE ARCHAEOLOGY IN SOUTHCENTRAL ALASKA

Author(s): Krasinski, Kathryn (Adelphi University)

Presentation Format: Oral

The alpine zone is one of the least understood zones in terms of prehistoric use. Recent work in ice patches in Yukon Territory, Canada and the Central Alaska Range and Wrangell-St. Elias in Alaska, United States, have contributed to understanding seasonal migration, hunting in the alpine zone, and dating the appearance of arrows. However, much less is known about sustained use of mountainous areas and trail networks in Alaska. The Chickaloon Trail, approximately following the Matanuska River, served as an important migratory pathway between the Copper River Valley and Cook Inlet. But until recently, no prehistoric remains were recorded in the mountains along this trail network. Ahtna and Dena'ina place names coupled with recent ethnographic interviews clearly demonstrate an intimate familiarity of the eastern Talkeetna Mountains. Site distribution and artifact type demonstrate continuity of use for millennia by Alaska Native people. The eastern Talkeetna Mountains were more than a migratory route, but also part of home.

A. SETTLEMENTS, ECONOMY AND MOBILITY IN THE ECRINS MASSIF DURING THE MIDDLE AGES: FIRST RESULTS OF A DOCTORAL RESEARCH

Author(s): Cesarini, Roxanne (Aix Marseille Univ, CNRS, LA3M, Aix-en-Provence)

Presentation Format: Poster

My archaeology PhD thesis aims to document the occupation and the exploitation of the mountain during the Middle Ages from the study of two neighbouring valleys of the Ecrins massif (Freissinières and Argentière-la-Bessée, Hautes-Alpes, France). This project aims to study this mountain territory from the bottom of the valley to the peaks (from 1200 to 3000 meters). My research is based on important works led since the 1980s on the environment, the landscape and the anthropisation of the mountains. This is a good time for gathering the available data and nourishing them with new elements. The aim of this new interdisciplinary research is to lift the veil on certain components of the medieval society, the peasant world, on the activities and on the landscape. Thus, this work addresses the character of mountain settlements, economic activities and mobility (housing and production places, humans, herds, products...). The Ecrins massif is an invaluable "living laboratory" to observe the evolution of the land use strategies since medieval times. Indeed, this territory offers the opportunity to cross archaeological, written, paleoenvironmental and bioarchaeological sources. In order to study the character of agropastoral sites, I will use an exploratory approach which involves coupling archaeological and geochemical methods. Finally, this research will document vertical land use on mountain environments in the Middle Ages, offer a land use model and bring elements of comparisons to think about the link between societies and environments.

200 BLOCK BY BLOCK. ARCHAEOLOGIES OF URBAN LIFE FROM CLASSICAL ANTIQUITY TO THE MIDDLE AGES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Berg, Ria (University of Tampere) - Coralini, Antonella (University of Bologna) - Karivieri, Arja (University of Stockholm; Institutum Romanum Finlandiae)

Format: Regular session

In recent research on ancient cities, interest has shifted from individual habitations, buildings, or single constructive units towards the study of more complex urban entities: housing clusters, city blocks, neighbourhoods or residential quarters. For example, in the city of Pompeii, on-going archaeological projects have increasingly adopted approaches by city block, not by single houses. Such entities form the fabric of the ancient city as organic, lived spaces. A similar shift of interest can be discerned in studies of the Classical world in the Western and Eastern Mediterranean, and is applicable also to the urban conglomerates of Late Antique and Medieval periods. Approaches by city block can be applied both in the study of urban sites, with no residential continuity, like Pompeii, Herculaneum, Ostia, Olynthus and Ephesus, and in cities that have had a long continuum of urban life like Rome, Cartagena, and Calleva Atrebatum/Silchester.

The aim of the session is to promote discussion on the theoretical basis, working methods and results already obtained by the use of urban archaeology applying the scale of city block. It also invites diachronic confrontations of research problems between Classical sites and Late Antique and Medieval cities.

ABSTRACTS

1 CITY BLOCKS AS STRUCTURAL AND DECORATIVE UNITS IN DIACHRONIC STUDIES – INTERCONNECTEDNESS OF MATERIAL, FUNCTION AND SPACE

Author(s): Karivieri, Arja (Institutum Romanum Finlandiae; Stockholm University)

Presentation Format: Oral

The study of larger neighbourhoods, city blocks or residential quarters in ancient and Mediaeval cities may be conducted in various ways, using a new theoretical approach, a specific scientific method, or testing several methods to be able to evaluate these methods and the possible diverse results that may lead to new ways of archaeological analysis, and promote studies on ancient cities as living entities, created by their inhabitants.

Cities may be studied as structural units, streets, gates, wells, walls, windows, entrances and floors, but also as decorative units, with painted wall surfaces, covered floors, wooden ceilings and panels. Another aspect concerns the study of the functions of various spaces, connected both to the availability of water, light, fuel, streets, storage, and the design of these specific structures. An approach may constitute of a study of a group of objects in a city complex, or, the distribution of graffiti or popular mythological motifs in a Regio or adjacent city blocks in Pompeii, providing a way to come nearer to the ancient way of reasoning and the use of space, the ancient methods of living.

2 BY 2 AND 3D-DOCUMENTATION TO 4D-INTERPRETATION OF INSULA V 1, POMPEII

Author(s): Leander, Anne-Marie (Lund University, Department of archaeology and ancient history; The Royal Swedish Academy of Letters, History and Antiquities)

Presentation Format: Oral

Digital approaches to standing remains in Pompeii, and their outcome are the issue of this presentation. The study of Insula V1 started as a traditional building archaeological project in 2000. An image database was implemented in 2008 (www.pompeijiprojektet.se) and enriched with 3D models processed after laser scanning in 2013-15. Subsequently, with the creation of 3DHop applications, the 3D archive developed into a means to address research questions, try old and raise new hypotheses and to discuss their validity in remote. Today, the study demands less time in the field and invites at any time to teamwork discussion on interpretation.

The 2D photographic database was created as a means of documentation and insula-wide comparison. The 3D archive adds information that cannot be obtained by the traditional means, not by photographs nor by scrutiny on site. It has proven an invaluable non-invasive way to pursue investigation, to further hypotheses emerging from the previous, traditional fieldwork and to indicate points of particular interest for future fieldwork. In interplay, the 2D and 3D archives produce a new bias to much discussed questions in Pompeian scholarship, such as, search for original plots and development of property lines over time, or spotting overall patterns of building materials or techniques and thereby assess their diagnostic value for historical interpretation. In this line of research one unexpected result concerns the probability for early, shared use of certain spaces of the insula interior.

The possibility to have both detail and bird's eye-visions makes the ancient building process visible in an unprecedented way. A new workflow is suggested, by which attempts to understand the development of Pompeian city-blocks should start by scrutiny of perimeters. To accelerate study, scanning should be effectuated early to permit remote study and conscious choices in documentation effort.

3 COMPARING POMPEIAN INSULAE BY FINDS - QUESTIONS OF MEANING AND METHODOLOGY

Author(s): Berg, Ria (University of Tampere)

Presentation Format: Oral

Arguably, in Vesuvian cities the housefloor finds are a type of evidence that mirrors most accurately the 79 AD living conditions and their short-term changes. However, the material studies have traditionally adopted typological approaches, and only in recent years, several projects have published finds also in their context of household or insula.

The present paper aims to discuss Pompeian city blocks or insulae as clusters of finds. In this Vesuvian city, the most drastic differences between various insulae are related to their excavation date, as the early excavations tended to leave many groups of finds unregistered, or the originally listed finds cannot any more be identified at the deposits of the Archaeological Museum of Naples. However, despite this caveat, as a methodological consideration, what question can or should be addressed to the housefloor finds at the level of insula? The most common approach to the finds has, by now, been at the level of one habitation unit, that forms a closed and independent household. What types of quantitative or qualitative differences between the finds in the insulae in various zones of the city could give meaningful results, relative to actual differences in lifestyles, professions or social statuses in its quarters?

4 A DESCRIPTION OF THE EXCAVATIONS OF POMPEII IN THE UNPUBLISHED NOTES OF A VISIT OF 1784 BY BAFFI. PRELIMINARY REMARKS

Author(s): Bellucci, Nikola (University of Bern)

Presentation Format: Oral

In the context of the papers of the famous classic philologist Pasquale Baffi (1749-1799), most of which today held in the National Library in Naples (BNN), this brief contribution will present preliminary remarks on an unpublished document concerning a visit to Pompeii, discovered among his dossier. In fact, the text represents one of the very few attestations within the Baffi corpus of his visits to the site of Pompeii demonstrating an unknown interest that the scholar had about the ancient city. Other documents show, moreover, that Baffi, as a member of the Herculaneum Academy, was often invited to Pompeii to allow study, especially to foreign scholars, such as G. Zoëga. Through a quick analysis of the document in question, it will be then provided brief critical and interpretative commentary notes to the text, which, although partially, thus results an important and further practical and descriptive document of the Pompeii of 1784.

5 GATED COMMUNITIES OF OSTIA

Author(s): Danilova, Anna (University of Bergen)

Presentation Format: Oral

Professional trade collegia were an important element of urban life in Ostia during the second and third centuries AD. They were multi-dimensional associations, which also owned considerable proportion of urban property of various kinds. This paper, which is a part of my PhD research project "Residential segregation in Ostia", analyses three case studies: Caseggiato del Temistocle; the architectural enclave along the Via del Serapide; and the complex formed by the collegial temple of the stuppatores together with Officina Stuppatoria along the Vicolo del Pino. It is discussed whether these urban entities can be associated with

professional trade collegia. The approach to the material combines spatial analysis and concepts from urban social geography, such as “neighborhood”, “community” and “gating”. The paper scrutinizes the nature of each of the suggested case studies, and discusses the possibility of presence in Ostia of such phenomenon as “gated community”, which is more commonly discussed in the context of modern urban residential segregation.

6 THE INSULA 30 IN THE ROMAN TOWN OF AUGUSTA RAURICA (CH)

Author(s): Straumann, Sven (University of Basel; Museum Augusta Raurica)

Presentation Format: Oral

In a recent PhD project the completely excavated insula 30 of the Roman colonial town Augusta Raurica (Augst/Kaiseraugst, CH) has been in the focus of an archaeological interpretation.

Centrally situated in the Upper Town of Augusta Raurica, the block (50 m x 60 m) known as Insula 30 was completely excavated between 1959 and 1962. Insula 30 is, so far, the only insula in Augusta Raurica that has been excavated in its entirety. Almost the entire area of 3,400 square metres was excavated down to the underlying natural subsoil, allowing not only the floor plans of the stone-built phases to be recorded (1st – 3rd century AD), but also the remains of its timber-built phases of the early 1st century AD. Therefore the whole development of this city block can be reconstructed.

The overall analysis aims an understanding of the functionality of this city block. In order to obtain results on the interaction with the urban surroundings computational methods, e.g. Space Syntax Analysis, has been applied. This not only gets us insights into the internal and functional organization of an insula but also knowledge about the relation between architecture and urban context.

7 THE LATRINES IN THE HOUSE ATTRIBUTED TO CANTABER IN CONIMBRIGA, PORTUGAL

Author(s): Acero Pérez, Jesús (University of Lisbon / FCT) - Correia, Virgílio (Conimbriga Monographic Museum)

Presentation Format: Oral

The so-called House of Cantaber is the largest domus excavated so far in Conimbriga (Lusitania province), the most renowned Roman city in Portugal. With a total area of 3260 m², the house occupies a whole block in a central area of the Roman city. It was discovered in the 1930s and partially re-excavated in the 1990s, when it was possible to date its construction to the end of the 1st century CE, being in use at least until the 6th century CE. Although its remains are visible, they are not so easy to read due to the poor state of conservation of some structures, the early 20th century restorations, and the lack of detailed chronostratigraphic information in some areas of the building.

This work aims to describe and analyse the two latrines identified on this domestic space. Furthermore, it will present for the first time a planimetry and a detailed graphic documentation of these structures. Both latrines are located in areas of the building close to the street, with easy access from surrounding roads, which makes us think of a “semi-public” use of these spaces. The one located in the west wing presents more problems of interpretation due to the current state of the archaeological remains. In contrast, the one on the east side shows a fairly good state of conservation. They represent unusual examples of Roman latrines with two different internal spaces (separation by sex?), although sharing the same drainage channel.

The location and design of these latrines allows us to reflect upon the management of physiological waste in both private and urban spaces during the Roman period.

8 HOUSING THE DEAD

Author(s): Wenn, Camilla Cecilie (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

While not *intra muros*, the cities of the dead offer their own building blocks of ancient cities. The necropoleis were not simply a place to deposit the dead. In one sense, they reflected the living city and formed part of it, but they also had an existence of their own. The necropoleis take many forms, but in the present context, the Northeast Necropolis of Hierapolis in Phrygia, Turkey, is a highly useful point of departure due to its organization and layout. Hierapolis had several necropoleis with slightly different chronologies and attachments, so to speak. The Northeastern Necropolis developed from the 1st century AD, and shows a change from the earlier, usually elaborate and more monumental graves erected individually, found predominantly in the North Necropolis, to standardized graves, often linked together constructionwise, creating grave nuclei, the city blocks of the necropolis. This opens discussions on how the new necropolis layout influenced the way the living interacted with each other and their dead; to what extent city society was transferred to reflected in the graves; how the graves and the dead in a nucleus related and compared to each other; and how within one nucleus the various graves would have entirely different histories from the Roman to Middle Byzantine Period.

9 CITY SQUARE AS CITY BLOCK. THE STUDY OF PUBLIC SQUARES IN MEDIEVAL CITIES

Author(s): Renn, Lisa (ZKFL - Zentrum für Kulturwissenschaftliche Forschung Lübeck; Albert-Ludwigs-Universität Freiburg)

Presentation Format: Oral

Public squares seem to be a typical element in the medieval city, giving space for markets, gatherings, proclamations etc. These squares were either planned and laid out during the foundation of the city, like in Lübeck (Germany), or subsequently constructed

by tearing down existing city blocks, like in Freiburg (Germany). While the public square is basically defined by its openness, the question arises if it can be seen as a city block, despite its apparent lacking buildings. Therefore, the focus shall lie on this element of the city, because is often neglected, although it can give an important insight into the city's development and structure as well as a reflection of the economic, social and political changes in the city. On the one hand the public square can be studied as an urban entity of its own, regarding its development and appearance. On the other hand, it forms an architectural, but also functional complex with its surrounding buildings, for which reason a study of their interaction can give an interesting insight into structural and functional developments in the city itself. Shifts in importance and perception concerning this urban unit in connection with other city blocks could be traced, giving a picture of the social, physical and functional dynamics in the city. Though the lack of buildings renders the public square an empty city block, the square should be regarded as its own neighbourhood, as the open space clearly gives just another example of a "lived space" in the medieval city.

10 BY INSULA. STUDY AND EDITION STRATEGIES OF ANCIENT CITIES: NOT ONLY POMPEII

Author(s): Antonella, Coralini (University of Bologna)

Presentation Format: Oral

E' noto a tutti, e da tutti accettato, che il modulo della città antica è l'isolato. E' questa la cellula che genera il tessuto urbano ed è da questa che deve partire la ricerca sugli antichi organismi urbani.

Questa consapevolezza ha sempre faticato nel tradursi in pratica nella ricerca e nell'edizione scientifica: anche nei casi in cui l'evidenza materiale lo avrebbe consentito, per la ricchezza e qualità dei dati, ha finito per prevalere l'approccio a scala di singola unità edilizia, pubblica o privata. Non mancano, però, alcune importanti eccezioni.

Di queste il contributo vuole tracciare la storia, alla ricerca di buone pratiche e di modelli sostenibili.

Oggetto dell'indagine sia le città a continuità di vita, sia le urbes extinctae.

Campione inevitabile, i siti vesuviani, Pompei ed Ercolano.

L'indagine prenderà in esame anche una selezione di altri siti urbani del mondo greco e romano, scelti fra quelli interessati da imprese di edizione scientifica.

A. LIVING AT THE GATES OF THE DANUBE DELTA. THE CITYSCAPE OF ANCIENT AEGYSSUS

Author(s): Stanc, Simina Margareta (Alexandru Ioan Cuza University) - Nuhu, George (Eco-Museum Research Institute Tulcea)

Presentation Format: Poster

Archaeological research undertaken at Aegyssus (Moesia Inferior, later province Scythia, present-day SE Romania) from 1971 to 1995/1998 has led to partially setting light on the history and evolution of the ancient city. After twenty years of archaeological campaigns a series of contexts ranging from early Roman period to the Middle Byzantine time were investigated. The most important building investigated so far is a Roman bath complex bordered by an area that might be connected with a residential core. In 2015, there was the restart of archaeological excavation, after almost twenty years of cessation, which shed new light on this archaeological site. Traditionally research employs a positivistic approach and nothing has been done for careful registration of the strata. During last two years, new methods were employed for the study of the site, including aerial photogrammetry using an UAV, with different cameras, and a caesium magnetometer for investigations. The authors would like to present an overall image of the ancient site from the old excavations to the new finds from 2015 campaign onward. Main aim is to present a holistic point of view of the ancient site, its urban planning evolution and a number of possible directory lines for the enhancement of the local heritage focus on the Lower Danube in connection with the major trends in European archaeology.

This research was supported by a grant of the Romanian Authority for Scientific Research and Innovation CNCS-UEFISCDI, project number PN-III-P4-ID-PCE-2016-0852 (within PNCDI III) and through an annually grant offered by the Tulcea Municipality.

201 THE 3 DIMENSIONS OF DIGITALIZED ARCHAEOLOGY – DATA MANAGEMENT, SCIENTIFIC BENEFIT AND RISKS OF DATA STORAGE IN ARCHAEOLOGICAL IMAGE-BASED 3D-DOCUMENTATION

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Hostettler, Marco (University of Bern) - Buhlke, Anja (Freelancer) - Reich, Johannes - Stähely, Corinne (University of Bern) - Drummer, Clara (Institute for Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel/ CRC 1266 Scales of Transformation)

Format: Regular session

Using just a smartphone and the right software, we can reproduce a 3-dimensional model of an excavation site in a highly-detailed resolution. Up to date, we are able to generate 3D-models of objects in different scales, of excavations on land and underwater, buildings, ruins or even whole landscapes. Today the creation of 3D-data is a widely accepted and an established procedure in Archaeology without being standardized yet.

While drawing with a pencil is becoming an obsolete technique, we instead face new challenges of creating reproducible workflows, how fully exploit and how to store digital data: After data-production, the question rises what scientific benefit can the data provide for research? What yet unsolved questions can be addressed with the analysis of 3D-data? In short: Does the acquisition of 3D-data have an additional scientific value?

Working with these techniques, we face an abundant amount of data not only to be analyzed but also to be stored. Do we need to archive all the raw data for future analyses or could we reduce the amount of bytes to store? How can a large quantity of data be handled for easy exchange between different researchers and different software-solutions? And how do we prevent information loss for future generations?

In this session, we invite researchers working with 3D-scanning techniques to tackle these pressing questions and to share Open Source solutions for data sharing, further analysis and storage.

The aim of the session is to discuss and to evaluate how to manage 3D-data in a meaningful way for scientific purposes and to find new ways to address the risks and challenges posed by digitalization.

In short: Where are we, where are we going, and how do we want to design the handling of 3D-data in Archaeology?

ABSTRACTS

- 1 ARCHIVING THE THIRD DIMENSION: PRODUCTION, USAGE AND MAINTENANCE OF STRUCTURE FROM MOTION MODELS IN CULTURAL HERITAGE MANAGEMENT**
Author(s): Kruse, Kristin - Schoenenberger, Esther (Canton of Zurich, Archaeology and Cultural Heritage)
Presentation Format: Oral

In 2017 the office for cultural heritage management of the Canton of Zurich has defined 3D-documentation with structure from motion (SfM) in Agisoft Photoscan as a new standard. The past two years have shown the advantages of the method, especially when documenting complex 3D structures, like skeletons or ruins, on site. The technology is also used for the capturing of whole sites by drone. The resulting orthophotos serve as background for mapping in ArcGis.

While generating 3D-models was a path well paved, the storage of 3D-models needed some exploration. The first challenge was to include the SfM-data into the current old-fashioned archive system and IT-infrastructure. The second challenge was to secure an easy access for everyone and long-term storage at the same time. The current solution treats access and storage as two separate matters. In order to view the content without limitations, each model will be available as a stand-alone application (e.g. 3D-PDF, Potree-Model). As for the long-term storage, the same models are maintained in a normalised geometry file (e.g. STL/OBJ-file). Long-term standards for 3D-data have yet to be established. Therefore, a backup-system was added by keeping the raw-data (photos) along with the processing report for replication purposes. Our solution comes with a lot of redundancy. However, this is still a trial and error approach, one that we would like to discuss with fellow 3D-enthusiasts.
- 2 AN INVESTIGATION OF DIGITAL AUTHENTICITY THROUGH USE OF GLITCHES FOR CREATING INTERACTIVE HERITAGE ENVIRONMENTS**
Author(s): Özdemir, Zeynep (Glasgow School of Art) - Aydın, Serdar (Mardin Artuklu University)
Presentation Format: Oral

This paper discusses glitches that occur as part of polygon mesh processing in 3D photogrammetry. The production of 3D geometries in photogrammetry is relevant to the object(s) being photographed or device-related parameters, e.g. camera lens and shutter speed. In this context, there are several determinants regarding the modelling of 3D mesh geometries, including transparency and brightness of objects and subtlety between repetitive elements. Data transformation from 2D images to 3D objects frequently changes the message and the glitch appears as part of the process. We present the results of a two-day workshop attended by four participants. We experimented the generation and the dissemination of glitches as both scholarly and creative products. The workshop showed how glitches (digital errors) could be exploited to rather catalyse communication between the machine and the audience. During the workshop, photographs were converted into 3D sculptures with 'errors' or as we define 'glitches' that appear like holes or dislocation of pixel's colour values. Such internal errors were taken as potentially representative of a gap in knowledge where users must project their own conceptual understanding to complete it. Decentralisation of the artefact from its materiality, by tolerating glitches of the digital transcoding processes, led us to evolution of means for stimulating the subjective performance of users whereby emotions and intertextual narratives can be represented.
- 3 THREE-DIMENSIONAL MODELING OF PETROGLYPHS OF SOUTH SIBERIA**
Author(s): Kovalev, Vasily - Kazakov, Vladislav - Zhumadilov, Kair - Lbova, Lyudmila (Novosibirsk State University) - Simukhin, Aleksandr (Institute for Mongolian, Buddhist and Tibetan Studies SB RAS)
Presentation Format: Oral

Traditional methods of documenting petroglyphs have several disadvantages. Thus, redrawing onto a transparent film gives inaccurate and subjective reproduction of the drawings, and when photographing, rock drawings are usually in insufficient resolution and geometrically distorted.

Over the past few years, attempts have been made to fix petroglyphs in digital form, including 3D scanning. These methods allow getting a digital image with the better quality and accuracy. Up to now methods of digital documentation of petroglyphs, including 3D have been testing on single separate objects. The task of large-scale working on hundreds and thousands of objects is not set yet.

At the same time, such work would make it possible to increase the accuracy of documentation of rock art monuments: with high

resolution, without geometrical distortions, including its third dimension and without the influence of a subjective factor. Also, work with the rock drawings in the field could be non-invasive and less time-consuming, and the results of the laboratory work would become reproducible on the basis of primary photographic materials. Having a three-dimensional model, it is possible to create a side-illumination of a drawing with program methods, programmatically measure the parameters of an object, including the depth of the mark, etc.

To represent three-dimensional models, a specialized information system in the web was developed with 3d-viewer based on the open source three.js library. Using such a self-written software product, it is possible to make a flexible adjustment of the functionality and design of the information system, including the implementation of an individual role-based data access model, tools for analyzing archaeological images in 3D form, etc. At the core of the data storage model there is modern and one of the most lightweight 3D formats – Draco from Google Open Source.

This work was supported by the Russian Science Foundation (project 18-78-10079).

4 PEOPLE OF LEPENSKI VIR: SHARING AND CARING FOR THE 3D OSTEOARCHAEOLOGICAL RECORD

Author(s): Pendic, Jugoslav (Biosense Institute, University of Novi Sad) - Jovanovic, Jelena (Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade; Biosense Institute, University of Novi Sad) - Markovic, Jelena (Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade) - Stefanovic, Sofija (Biosense Institute, University of Novi Sad; Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade; Medical faculty, University of Novi Sad) - Stojanovic, Dragoslav (Department of Archaeology, Laboratory for Bioarchaeology, University of Belgrade)

Presentation Format: Oral

In the past years, means of acquisition of 3D information became all present - the requirements to successfully create an accurately reconstructed copy of an object in 3D dramatically plummeted and made the process broadly available to both professionals and enthusiasts alike. The IBM (Image Based Modelling) on it's basic levels required only a camera and some overcast sky or studio light, to have your site, your trench or a newly uncovered artifact, preserved as accurately scaled digital copy, for as long as the storage units would hold the data. The more important question has been treated as of late - what to do with created models, and what value do they add to the research work, if any?

Project "People of Lepenski Vir: protocols for digitalization of bioarchaeological heritage" used number of techniques to capture and store 3D data of the osteoarchaeological record from Danubian gorge, dated to Mesolithic and Neolithic period. Laboratory for Bioarchaeology aimed to provide open access to the so created 3D models. In order to enrich the experience, basic functions of metric data collection, surface model visualizations, model section analysis were added; but more importantly a robust database structure was created and populated to provide for metadata for each scanned fragment of bone. This structure allowed for further expansion of the collection, to other sites and periods.

In this paper, we present experiences gained, with special note on the benefits of having an open access to 3D collections of the archaeological material, for the purposes of education and information exchange.

5 THE USE OF 3D TECHNOLOGIES IN THE STUDY OF CAVE ART IN KAPOVA CAVE

Author(s): Anisovets, Yulia (Lomonosov Moscow State University) - Baskova, Varvara (Institute of Archaeology Russian Academy of Sciences; Lomonosov Moscow State University) - Bakin, Mikhail (Russian Social State University)

Presentation Format: Oral

Kapova cave is situated in the Southern Urals, and it is a unique cave in Russia with reliable Upper Paleolithic wall paintings. It is a limestone karst cave with three hypsometric levels. Radiocarbon dating of archaeological layers in the cave showed the interval between 19500 and 16000 BP.

Archaeological excavations have revealed traces of different short-term human activity in the cave, which were expressed in symbolic and daily practices. 3D-modelling of these findings along with photogrammetry could be applied here to study them post-factum, create a broad digital catalogue for both scientific and popularization purposes.

First of all, the study of wall paintings based on their 3D-models created possibilities for comparison, relief analysis and understanding of compositional principles. 3D-models allowed the authors to work with all images at once, comparing them to each other. Usually it is impossible due to the fact that all images are very distant from each other and photos do not provide an overall view of all characteristics. This enabled to make new conclusions in documenting the images in the Chamber of Sings and the Chamber of Paintings.

Secondly, this approach has been applied to the «stone blockage» - a new studied object in the Dome Chamber of the cave. It consists of a large amount of stones of various size, where plaquettes and stones with ochre, concentrations of clay or ochre and some other archaeological artefacts were found. Some fragments of plaquettes with ochre stains fit each other. 3D scanning allowed to combine all parts of a slab together and reveal the characteristics of the initial surface and ochre, which was put on it.

Thus, 3D technologies can be applied to all types of practices in caves and be irreplaceable method of office finds study.

- 6 ANDEAN CEREMONIAL LANDSCAPE, DIGITAL TOOLS ON THE EXAMPLE OF THE PRE-COLUMBIAN ORACLE APU COROPUNA, MODERN TECHNOLOGIES IN DIFFICULT TERRAIN**
Author(s): Sobczyk, Maciej (Center for Precolumbian Study University of Warsaw) - Ćmielewski, Bartłomiej (Laboratory of 3D Scanning and Modeling, Wrocław University of Science and Technology)
Presentation Format: Oral
- The Nevado Coropuna (Peru) is surrounded by numerous archaeological sites. This mountain was mentioned many times by Spanish chroniclers and documents (Pedro Cieza de León, Felipe Guaman Poma de Ayala, Cristóbal de Albornoz). Coropuna oracle as the place where the human capacocha type offerings arrived, authors mention the temple of Nevado Coropuna. Undoubtedly, the important huaca in the Inca beliefs needed its own place, dedicated to its service, the place where the pilgrims could arrive and where the rites and offerings could be made. According to our research, this place was the monumental site now known as Maucallacta-Pampacolca (over 50 hectares). It was founded at an altitude of between 3,600 - 3,800 meters above sea level. Maucallacta contains more than 250 stone buildings, well adapted to the unevenness of the terrain, are characterized by their large dimensions - with a rectangular floor plan - and spatial planning in sets - that surround the squares. The system of narrow paths with ramps and stairs allows communication between the squares located in the different reliefs. Maucallacta, by the visual contact, the complexity of the plane, and also by the elaborated character of several of its structures, could have been the place mentioned by the chroniclers and the main administrative-religious center, related to the cult of the Apu: the oracle of Coropuna. Another question is how were the relations with the rest of the network of sites, the pilgrimages, and their ceremonies. High mountains are becoming an interesting challenge. Among the tools used in the research, remote sensing techniques were found with different effectiveness. Because of that, some comparison was performed to check the spatial accuracy of architectural elements, vertical accuracy of terrain reconstruction obtained by classical survey, terrestrial and aerial (UAV): photogrammetry, lidar.
- 7 AZTECS IN THE POINT CLOUD. DOCUMENTATION AND ANALYSIS OF AZTEC ARCHITECTURE AT THE SITE OF TETZCOTZINCO**
Author(s): Prusaczyk, Daniel - Juszczyk, Karolina (Institute of Iberian and Ibero-American Studies, University of Warsaw)
Presentation Format: Oral
- Tetzcotzinco is one of the most important and best preserved archaeological sites of the Aztec area. Tetzcotzinco is mainly known for a monumental garden complex planned by the ruler of the city of Texcoco – Nezahualcoyotl. This enormous complex served for entertainment of the royal family. This garden also was one of the largest botanical collections of the world in 15th century. Like other Mexican garden complexes, Tetzcotzinco also served for symbolic functions, expressed the worldview and acted as place of celebrating the rituals. Today, Tetzcotzinco is an archaeological site with the most numerous remains of a hydraulic system and various stone and monolithic buildings from the Aztec times.
- The paper aims to present the results of the documentation of the Tetzcotzinco site, using 3D scanning, photogrammetry, and photography. The three-dimensional models create a rich base for researches on the issues of construction and renovation of Aztec remnants on this site. We will also present one of the main goals of our researches: the reconstruction of the actual form of the architecture at Tetzcotzinco and the attempt to trace the changes and damages that affected it. In addition, the effects of documentation and 3D scanning will be used to reproduce the plans of the entire rich hydraulic system at Tetzcotzinco. All the collected materials were used to create an interactive GIS database, which collects all the data on the construction of this pre-Hispanic complex.
- 8 3 DIMENSIONAL DIGITIZING OF UNDERWATER EXCAVATIONS: APPLICATION OF COMPUTER VISION FOR THE RECORDING AND ANALYSIS OF LAKESHORE SITES IN AUSTRIA**
Author(s): Dworsky, Cyril - Seidl da Fonseca, Helena - Pohl, Henrik (Kuratorium Pfahlbauten) - Weißling, Ronny (Crazy Eye OG) - Leskovar, Jutta (Landesmuseum Oberösterreich)
Presentation Format: Oral
- Since 2015 every year an underwater excavation on lakeshore sites took place at the Lakes Attersee and Mondsee in Upper Austria. The excavations are part of the national research project "Zeitensprung". The main focus of the project is to gain new data for a large exhibition about the UNESCO World Heritage "Pile dwellings around the Alps" in Upper Austria in 2027.
- Therefore, the sites are recorded using Structure from Motion (SfM) and Multi View Stereo (MVS) not only for documentation purposes, but also with the goal of an appealing visualisation of the excavation process for the public.
- Until now, three prehistoric sites were excavated: Seewalchen I, Weyregg II and Mooswinkel. All sites are located in shallow water of about 2 to 3 meters depth. As all of them were systematically recorded, using an image based modelling approach, the time has come to show the benefits and the challenges of this technique. This paper presents not only the recording workflow or the final results, but is asking what the added value of the application of SfM and MVS is. We will present our insights in handling SfM and MVS derived data during the excavation and post excavation process.

- 9** **AMPHITHEATER OF SAINTES (FRANCE, CHARENTE-MARITIME): A 3D DATA MANAGEMENT FOR ARCHITECTURAL PROJECT AND ARCHAEOLOGICAL STUDY**
Author(s): Fouriaux, François - Nadeau, Antoine - Piat, Jean-Luc (Bureau d'études Éveha) - Ricaud, Elsa (Agence SUNMETRON) - Saulière, Nicolas - Tendron, Graziella (Bureau d'études Éveha)
Presentation Format: Oral
- As part of a project to restore and enhance the amphitheater of Saintes, an archaeological survey campaign and architectural study prior to the development work was conducted by the team of Eveha in collaboration with the architectural preservation agency Sunmetron in November 2017. An innovative method of investigation, combining digital surveying and GIS, documentary research, architectural observations and archaeological excavations, allowed a global and detailed reading of the monument.
- This show building of the ancient Roman city of Mediolanum Santonum was the subject of many archaeological excavations from 1877 until today. Many uncertainties about its architecture remain, and a detailed survey of the entire monument was necessary in order to identify the different phases of antic constructions and modern restorations.
- Uniform documentation for the entire monument was made by photogrammetric and topographic surveys and collected in a GIS. In this way, we dispose of 2 complementary tools to perform the study of the monument, that composes a permanent dialogue. In one hand we have a 3D photogrammetric model from which we can export different geolocalised documents likes orthophotography and DEM. On the other hand, the GIS into all the documentation is integrated and permits to question the monument. News hypothesis thereby produced are integrated into the 3D model.
- This method allowed us to perform an analysis of the amphitheater in volume, to confront the documents produced during a century and a half, and to produce a critical plan of the authenticity of elevations. The new archaeological observations have also been integrated into this system, and have made it possible to highlight new elements on the general organization of the building.
- This presentation presents a case of data management using photogrammetric survey and 3D reconstruction, not only for archaeological study but also for architectural conservation and rehabilitation of the amphitheater.
- 10** **BATHING IN THE POMPEIAN LIGHT - INTEGRATING SFM TECHNOLOGY IN EXCAVATION AND STANDING REMAINS ASSESSMENT**
Author(s): Rummel, Christoph (RGK - Romano-Germanic Commission DAI) - Brünenberg, Clemens (Technische Universität Darmstadt)
Presentation Format: Oral
- Since 2015, the Freie Universität Berlin has conducted a major research project under the direction of Prof. Monika Trümper within the TOPOI Excellence Cluster framework, investigating the development of Roman bathing culture at Pompeii. The work involved excavation and standing remains assessment at two key bathing complexes of the city, the Republican and Stabian Baths. During the fieldwork carried out from 2015-2018, structure from motion technology was used for several aspects of the project, from archaeological documentation in the trenches to detailed assessments of the impressive standing remains, particularly so for the Stabian Baths.
- Building on this experience, this paper seeks to address some key points of importance for the work with large SFM data sets that were encountered over the past years. In addition to addressing the themes highlighted by the session organisers, this will include a discussion of the development of standards for the creation and use of SFM models, with particular regard to accuracy, LOD (Level of Detail), Scientific Value, and georeferencing, among other aspects – although experience shows that demands vary from project to project. In addition, the paper will address the different needs (and possibilities) faced by the excavators and the standing remains assessors involved in the project and highlight the potential the technology offers for reconstruction of technical and engineering aspects of complex buildings such as Roman Baths.
- 11** **THE USE OF 3D MODELING IN THE ANALYSIS OF TECHNOLOGICAL TRACES ON PREHISTORIC MOBILIAR ART**
Author(s): Basile, Martina (Sapienza-University of Rome; University of Valencia) - Repola, Leopoldo (Suor Orsola Benincasa University of Naples) - Lemorini, Cristina - Zampetti, Daniela (Sapienza- University of Rome)
Presentation Format: Oral
- The study of the technological traces detectable on the archaeological finds is fundamental for the reconstruction of the gestures of the past in any prehistoric research. In fact, the technological traces act as a “fingerprint” of the instrument that produced them, and, indirectly illustrate the hand that made them. The working surface where the technological traces are present is not completely flat and it is generally rough and uneven due to post-depositional alteration. The proposed research examines new methods for the three-dimensional analysis of the technological traces, taking as reference the geometrical characteristics of its working surface. This combined analysis can indeed be an additional advantage to the study of technological traces, opening a wider space for interpretation. In this study, mentioned methodology has been tested on stone and bone replicas of mobilier art from prehistoric contexts from Italy and Spain. After the creation of experimental technological traces, we analyzed and documented them with a Dinolite® digital microscope. During this phase, the working surface of the experimental replicas was positioned at different angles keeping its focus of the digital microscope unchanged, in order to collinear the different captured images. The photos produced were processed through an image-based software for the creating of real numerical models

textualized to different degrees of accuracy.

12 ON THE BENEFITS AND LIMITATIONS OF THE APPLICATION OF NON-DESTRUCTIVE INVESTIGATION AND DOCUMENTATION TECHNIQUES ILLUSTRATED ON A LATE MESOLITHIC BURIAL

Author(s): Buhlke, Anja (Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum; Freelancer) - Ismail-Weber, Maha - Schopper, Franz (Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum) - Hildebrandt, Thomas - Fritsch, Guido (Leibniz-Institut für Zoo- und Wildtierforschung, Berlin) - Weinhold, Joachim - Jerichow, Samuel - Schwandt, Hartmut (Institut für Mathematik, Technische Universität, Berlin)

Presentation Format: Oral

Non-destructive investigation as well as modern documentation and presentation techniques present an appealing alternative to conventional methods employed to uncover, document and examine block excavations. The application of three-dimensional (3D) computer tomography, 3D printing as well as 3D photogrammetry provides a quick, easy to use, reliable and inexpensive means to investigate and record archaeological structures and cultural artifacts. Further advantages over conventional techniques include the three-dimensional presentation of archaeological findings in situ as well as the valuable information on the composition and structure that 3D imaging provides. For some time now, 3D methods have been employed in archaeological settings where they produced good results. The limitations and requirements of applying these non-invasive methods, however, are rarely discussed. Therefore, based on the example of the late Mesolithic block excavation found in Rathsdorf (Märkisch-Oderland/Brandenburg), this paper aims to present and discuss the benefits and disadvantages of 3D techniques over conventional excavation methods.

13 A NEW SPATIAL ANALYSIS SYSTEM AND 3D MICROSTRATIGRAPHIC VISUALISATION AT PORTA NOCERA (POMPEII): 3D NOT ONLY FOR THE SHOW

Author(s): Fouriaux, François (École française de Rome)

Presentation Format: Oral

The excavation carried out in 2018 by W. Van Andringa, T. Creissen & H. Duday at Porta Nocera, Pompeii, brought to light a new funerary enclosure. During the excavation of this enclosure, a homogeneous layer was unearthed right below the eruptive deposit layers of 79 AD. This stratum revealed several traces of occupation linked to the funerary enclosure.

The material collected in this stratum was heterogeneous and very fragmented. Besides, it presented a very particular distribution. Several concentrations of fragments belonging to the same objects (glass or ceramics) were lying against some steles. These steles were partially covered with different occupations layers but were still visible when the aforementioned objects were dropped off. A very fine excavation was realized while the position and form of every single fragment unearthed was methodically recorded in situ to supplement the multidisciplinary studies done by specialists. This work method allowed us to implement an innovative 3D spatial analysis of the objects and their fragmentation.

The purpose of this communication is to present the work method we developed. This method, which relied on graph theory, spatial analysis and 3D visualization, enables us to address the history of the objects after their primary drop off and breaking. The specific use of 3D documentation, based on photogrammetric and topographical survey help us to lead a very accurate study of this deposit.

Though the study of this funerary enclosure is still on-going, preliminary results already enable us to address the history of funerary enclosures' frequenting considering microstratigraphy.

A. DIGITAL CASTING: FROM THE STONE MOULDS TO THE 3D ARTEFACT

Author(s): Sannito, Matilde - Quaglio, Valentina - Faresin, Emanuela - Salemi, Giuseppe (Università degli Studi di Padova)

Presentation Format: Poster

The evolution of the 3D modelling techniques and the development of more efficient systems for the visualization of digital data, highlight the added value given by the use of these methods in the archaeological field. This technology can be applied to the world of Cultural Heritage as a vessel for preservation, reconstruction, documentation, research and promotion.

This paper presents a workflow methodology in order to obtain the casted object from eight moulds, found during the excavation activities of the Iron Age site of the Questura in Padua, Italy. These objects, dating to the VIII century BC, were recovered from a pyrotechnological productive area of the site, which gave back many elements of the metallurgic workflow, but an extremely limited number of bronze artefacts.

The eight moulds, carved on one or more surfaces to allow the maximum exploitation of the lithic support, were acquired with a 3D scanning system. With the 3D high resolution models, obtained from the post processing phase, the carved valves were isolated and treated with a Reverse Engineering procedure in order to "digitally" cast the artefacts.

B. HOW TO SCAN A MAMMOTH. RECORDING, ANALYZING AND PRESENTING CT SCANNED 3D DATA OF A LATEGLACIAL PROBOSCIDEAN FROM ROTKREUZ, SWITZERLAND

Author(s): Reinhard, Jochen - Huber, Renata (Amt für Denkmalpflege und Archäologie)

Presentation Format: Poster

In 2015, a tusk and several bones of the postcranial skeleton of a woolly mammoth (*Mammuthus primigenius*) have been found during construction work in Risch-Rotkreuz (Canton Zug, Switzerland). Dating to around 15'000 B. C., the capital bull is one of the latest known mammoth finds from the Swiss plateau shortly before the species went extinct regionally. Though fragmented, the impressive size of the tusk and the nearly perfect condition of the bone substance demanded a scientific and museum presentation from early on. To make them available to both researchers and the wider public alike, all finds were subjected to computer tomography scans. The bones could be fitted into a clinical CT scanner at the local hospital (Siemens Somatom Definition AS) with good results. Subsequently, image segmentation was performed on the standardized DICOM image stacks using the open source software '3DSlicer' to export 3D models. The sheer size of the tusk made clinical CT impossible – it was scanned with an industrial CT scanner by Qualitech AG, Mägenwil. Even here, four scans were necessary to record the whole specimen. The resulting data is of significantly higher resolution compared to the clinical scans, but lower and changing contrast as well as scanning artefacts resulted in difficulties for image segmentation and the analysis of the tusk's inner structure. Albeit this, the CT data allow the assessment of the ivory's banding of varying density commonly interpreted as incremental (annual?) growth of the tusk. Through the hosting platform 'Sketchfab' all 3D data is, in slightly reduced complexity, made publicly available to view, interact with and download for everyone. QR codes interlink the web presentation with conventional publication and museum exhibition. In addition, the 3D models and printed copies of the mammoth finds are used as educational material at the local Museum für Urgeschichte(n) in Zug.

C. 3D LASER SCANNING CONTRIBUTIONS TOWARD UNDERSTANDING AND PRESERVING MEDIEVAL TUNNELS OF THE FRENCH MASSIF CENTRAL

Author(s): Surmely, Fred (DRAC ARA) - Chalin, Jean-Baptiste (Association Terre Ancienne)

Presentation Format: Poster

The estimated number of medieval tunnels in France is in the tens of thousands. Nearly 500 have been recorded in the Auvergne region. Traditional surveys were carried out using measuring tapes, topography lasers, compasses, and clinometers. Using modern topographical instruments such as theodolites or GPS, is impossible because of the tight spaces in the tunnels and lack of satellite access. Therefore, we tried a new measuring instrument, a 3D laser scanner. Its capacity to render high precision surveys by associating stations and combining inside and outside measurements allows for connecting these subterranean structures with their external environments. The small size of the 3D laser scanner is ideal in confined spaces. Our work in the Auvergne represents a pioneering experiment. Two tunnels of the south Cantal (Mourjou and Montvert) were our experimental sites. By crossing internal and external scans, a tunnel can be positioned in reference to the surface offering useful data which aids in the preservation and understanding of these widely known but poorly researched underground structures.

D. IN ROCK WE TRUST? EXPLORING THE DOCUMENTATION, ANALYSIS, PUBLICATION AND ARCHIVING OF 3D DATA OF ENDANGERED ALPINE ROCK ART

Author(s): Reinhard, Jochen (archaeobotics)

Presentation Format: Poster

With the advent of easy-to-use image based modelling software packages ranging from free and open source tools to commercial solutions, 3D photogrammetry has become simple for everybody with just a camera and a computer. Even though larger projects still require more investment in equipment, time and knowledge, good results can today easily be achieved using just a smartphone camera and a standard off-the-shelf laptop following a video tutorial. Consequently, more and more use of 3D photogrammetry can be observed in archaeological publications as it slowly grows into a standard method. Still, the application of 3D modelling rarely exceeds basic documentation, it is often simply used as a vehicle to create 2D or 2.5D data (e. g. True Orthophotos or Digital Surface Models) – the full use of 3D data for archaeological purposes is still largely underexplored.

A stone slab from Zermatt-Hubelwäng (Canton of Valais, Switzerland) covered with cup marks and petroglyphs will serve as a test bed for visualising its rock art with different methods. Techniques from both the GIS world and 3D computer graphics are compared for their suitability to make the petroglyphs legible and to assess the state of the monument which is under pressure by touristic activities including a nearby hiking path. Finally, aspects of publishing and long-time-archiving of 3D data are discussed.

202 MEDIEVAL BUILDINGS AT RISK: CHALLENGES, ANALYSES, AND SOLUTIONS

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Kerr, Sarah (Trinity College Dublin) - Patrick, Laura (Queen's University Belfast) - Bouwmeester, Jeroen (Rijksdienst voor het Cultureel Erfgoed)

Format: Regular session

The challenges facing medieval buildings, and those who study them, have never been greater. There are a number of obstacles including planning restrictions, ownership, funding, and, more so now than ever, climate change. Rising sea levels are destroying

coastal buildings, increased acidic rainfall is causing greater rates of erosion, creeping desert sands are crushing ruins, and record-breaking winds are causing monumental collapses. There is a renewed sense of urgency to record and attempt to save medieval buildings at risk.

Archaeologists cannot stop climate change nor eradicate many of the challenges facing medieval buildings; however, is the sector doing enough to make a priority of saving buildings at risk? Are local solutions adequate or is a broader approach required? This session invites papers documenting medieval buildings at risk from any challenge particularly, but not restricted to, climate change. Furthermore, stories of success and failure in relation to restoration, preventive conservation, planning legislation, as well as exploratory papers examining possible solutions are welcomed.

ABSTRACTS

1 CARRICKFERGUS TOWNSCAPE HERITAGE INITIATIVE: A HIDDEN TOWER HOUSE

Author(s): Patrick, Laura (Queen's University Belfast)

Presentation Format: Oral

Carrickfergus Townscape Heritage Initiative (THI) is funded by the Heritage Lottery Fund, and delivered by the Mid and East Antrim Borough Council. The project, 2016 to 2020, supports local property owners in caring for and preserving the town's historic fabric. Additionally, an Education Programme raises awareness of the importance of our local built heritage, and why it should be preserved for future generations.

Despite the fact that Carrickfergus was once the premier town in medieval Ulster, unlike its counter parts in the south of the Ireland, for example Kilkenny, much of the town's medieval fabric has been lost. This loss has been caused through periods of both destruction and 'improvement'. Until recently the only structures with any upstanding, positively identified medieval fabric were the castle and St Nicholas Church, although the latter has been heavily modified. However, thanks to the survival of 16th century maps, visual evidence provides us with confirmation that there were a range of medieval buildings in the town. The location of a small selection of have been identified through rescue excavations, but it was only in 2018 that remains of an upstanding tower house were revealed, thanks to support from the THI Education Programme.

This paper looks at the investigative process that was undertaken, the findings and final outputs. Also addressed is the way in which buildings are reinterpreted visually for the public, the town-scape and wider tourism offering. Given the proximity to the coast, how can such a building be protected from coastal erosion and major existing damp issues, while also functioning as a working hotel? As the building was listed, not scheduled, and the earliest photographic image is from c.1890, should it be presented as a tower house, or a Victorian style building? The final planning decision will also be explored in this paper.

2 IN-SITU PRESERVATION OF MEDIEVAL ARCHAEOLOGICAL STRUCTURES IN TRONDHEIM, NORWAY

Author(s): Cadamarteri, Julian - Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

Norwegian medieval towns are subject to extensive urban transformations and renovations which have triggered large archaeological projects over the past decades. It has resulted in the in-situ restoration and preservation of many sites and vestiges of various dimensions with good results. Still, there is little indication that the layperson is either informed or involved.

In-situ museums tend to not be integrated in the planning and life of the city and thus lie separated from the public understanding of the urban development and history of the city. This is thus an underused resource for city planners and urban developers and for the general public.

We will approach the topic through a case study of in-situ building remains from archaeological excavations in Trondheim, with particular focus on the medieval period (from AD 1000 to 1550). They will be analysed in the light of the national and international debates currently surrounding the methods used to disseminate information and research about excavation of medieval building sites.

3 MEDIEVAL ARCHITECTURE AROUND AFRICAN CITIES. KHARTOUM AND OMDURMAN CITIES CASE STUDIES

Author(s): Drzewiecki, Mariusz (Polish Centre of Mediterranean Archaeology, University of Warsaw)

Presentation Format: Oral

Last twenty years was a time of rapid urban development in Africa. Large centres are often located in areas which people in the past also favoured. The author is conducting archaeological projects in Khartoum Province, on the outskirts of Sudan largest cities, Khartoum and Omdurman.

Remains of medieval capital in Soba are now being incorporated into the modern residential district of Khartoum. The remains of the capital covered 275ha. Now only 53ha are available for research. On the outskirts of Omdurman, early medieval forts are being damaged by agricultural and building activities. The situation seems hopeless.

The light in a tunnel are people who live in the area and are interested in saving the heritage. The author in collaboration with National Corporation for Antiquities and Museums of Sudan and Al-Neelain University is launching projects to document the

heritage engaging the local population in the process. Positive remarks can be expected at the end of the presentation.

Projects are funded by National Science Centre (Poland) based on agreements nos UMO-2016/21/D/HS3/02972 and UMO-2018/29/B/HS3/02533.

4 **THREE NOBLE MEDIEVAL DWELLINGS IN CARDONA (BARCELONA): THREE DIFFERENT WAYS TO UNDERSTAND HERITAGE BY THEIR OWNERS**

Author(s): Pancorbo Picó, Ainhoa (Town Hall of Cardona)

Presentation Format: Oral

Besides the well known outstanding heritage in Cardona enjoying the maximum legal protection, as the castle and the Romanesque canonical church, both presiding the medieval town, we can also find three other buildings scattered inside the gothic wall of Cardona which can be defined as palaces or noble dwellings. Located below the hill of the castle, and therefore visually communicated, two of them can be traced back to the 13th century while the third one is a Renaissance building probably built above a medieval one. Apart from analyzing the typology of these three interesting buildings and its distribution and comparing them with other well known parallels near them, in this paper we are going to study how their owners faced the challenge of its preservation once the properties, in really bad conditions, came into their hands; in which state we found them around year 2000, and how we currently find them. We are also going to review the knowledge the neighbors had about them at the beginnings and which one they have nowadays. In summary, we are going to see three extremely different ways of understanding heritage and therefore three different ways of preserving it and leaving it to our descendants.

5 **HERITAGE AT RISK: ISSUES, IDENTITIES, AND SOLUTIONS**

Author(s): Kerr, Sarah (Trinity College Dublin)

Presentation Format: Oral

Ireland and Britain suffered considerable damage to their standing archaeology during a series of storms in 2018. These monumental losses coincided with the report by United Nations/ Intergovernmental Panel on Climate Change (October 2018) which detailed the impacts of global warming of 1.5 °C above pre-industrial levels, including an increase in the severity and incidence of extreme weather events, such as cyclones. The report argues for a cross-regional response to climate change, and discusses detrimental impacts to 'social and cultural assets'. Several European-level reports indicate that an interdisciplinary approach must be implemented to tackle this and other societal challenges (E.g. European Commission 2013, 163; European Commission 2017, 16).

This paper will introduce a number of case studies deemed at-risk from climate change-related storms and the specific challenges facing each. The potential impacts on cultural identity will be examined, through the prism of medieval building loss, drawing on interdisciplinary theories and approaches. The third element of the paper will explore the local and national strategies in place to tackle these issues set within the European context.

A. **MEDIEVAL BUILDINGS UNDER THE III. COURTYARD OF PRAGUE CASTLE. HERITAGE MANAGEMENT AND EVALUATION OF THE ACTUAL AND FUTURE RISKS**

Author(s): Tomanova, Pavla - Herichova, Iva - Marikova-Kubkova, Jana (Institute of Archeology of the Czech Academy of Sciences, Prague) - Valek, Jan - Stuchlikova, Eva (Institute of Theoretical and Applied Mechanics of the Czech Academy of Sciences)

Presentation Format: Poster

Extensive archaeological excavations of the III. Courtyard of Prague Castle conducted in the 1920s uncovered medieval buildings of various functions (profane, sacral and defensive) and of different construction materials (wooden and stone). The uncovered features were preserved in situ, using conservation methods of the period, and the areal was covered with a concrete desk, with the aim of presenting it to the public. Although this aim has never been fully realized, this method of conservation exposes the historical features to unstable external conditions and causes particular risk for their future preservation. In general, the heritage management of this unique archaeological areal poses complex problems that do not have any parallels at other sites. Suitable heritage care is being developed by a specialized department of the Institute of Archaeology of the Academy of Sciences of the Czech Republic, v. v. i., contracted by the Office of the President of the Republic.

Presently, a research project „Lime materials for restoration and conservation of authentic elements of historic structures” is being conducted to identify the most appropriate heritage management approach for the uniquely preserved archaeological areal. Within this project, a 3D map of the archaeological areal appended with a geo-informatic database is being created, documenting authentic versus reconstructed elements of the medieval buildings. The map will help with future monitoring of the stability of the exposed archaeological features. Another aim of the project is to evaluate the past conservation methods used and develop functional and applicable mortar mixtures for future repairs. The full project specification and its preliminary results are the subjects of the proposed poster.

Theme: Archaeological theory and methods beyond paradigms

Organisers: Girotto, Chiara (Goethe University Frankfurt) - Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Institute of Archaeology) - Rivers, Ray (Imperial College London) - Nakoinz, Oliver (Christian Albrechts University in Kiel)

Format: Regular session

Discussions on modelling the past have identified the crisis of ideas in archaeological research beyond the Age of paradigms. There is the basic issue that, quantitative or not, modelling demands simplification, creating a caricature of the society it is describing. We have to question whether highly theoretic archaeological modelling, with a tendency to create environmentally driven models, devoid of cognitive human factors are more than a travesty of the archaeology that they purport to describe.

Is it too late to turn our back on the potential of simplified explanation, based on statistical methods and the analysis of 'big data', often mimicking approaches, mindsets, and values similar to contemporaneous societies? Or should we rather look for the emergence of new syntheses, respectful of the different paradigms, by harnessing the integrative power that modelling, quantitatively and otherwise, can provide?

In this session we aim to continue the discussions from last year's session "397: Modelling the past: Crisis of ideas in modern archaeology", which exemplified the current state of the art. This session especially aims to discuss the integrated future of theoretical archaeological research by further specifying the 'shapes' of crisis and trajectories for the Age beyond paradigms and attempting to find a middle ground between generic theory modelling and detailed structuring of data. We wish to approach the following questions:

- Based on the data, are the questions we ask too complex for the models to address?
- How does the acknowledgement of complexity theory alter the approach to a model?
- How are narratives encoded in models?
- Are we getting lost in multiple meanings or rather exploring the potential of manifold explanations for a phenomenon?
- Is there any empirical evidence that cannot be explained from the perspective of any paradigm?
- How are we creating Processualism 2.0?

ABSTRACTS

1 MODELLING AND THEORY: SHAPING INTEGRATIVE WORKFLOWS AND CONCEPTS IN ARCHAEOLOGY

Author(s): Nakoinz, Oliver (Johanna Mestorf Academy, University of Kiel)

Presentation Format: Oral

The leftovers of the once powerful paradigms left us with the naive assumption that modelling and quantitative approaches allow to answer historical, social, cultural and even economic questions directly at the one hand and the fact, that the striking evidence of observations can not be used as long as we do not explore the data internal structures to their full extent. We know that both extremes are not contributing to valid research and that a combination of paradigms and approaches is required. The integration is obviously a problem of developing concepts, practices, and workflows of an integrated approach.

Since we tend to stick to the concepts of our academic socialisation, we usually prefer one of the paradigmatic workflows of sciences and humanities instead of integrating them. This integration has to address the question of integrating the narrative into science based workflows. Models not understood only as tool for simulations and regression but as a conceptual framework useful for communication between different communities, academic or not, can help do put the required integration into practice. In addition to the two traditional paradigms we have to face the changes induced by digital data and workflows. Automation and handling of digital data changes the focus of the researcher and hence research practice. This paper aims to explore the different workflows and develop a concept for shaping new workflows according to the new requirements.

2 IS MODELLING THE PAST LESS COMPLICATED THAN WE THINK?

Author(s): Rivers, Ray - Evans, Tim (Imperial College London)

Presentation Format: Oral

It is a truism that modelling the past, by adopting simplifying assumptions, provides a caricature of the society it purports to describe. However, the old adage that 'I can describe an elephant with four parameters and with five make it wave its trunk' means that the theoretical modelling which we adopt to describe systems for which the data is limited must not be too epicyclic, adding wheels on wheels to 'save the phenomena'. If so it becomes useless, merely data fitting.

In this talk we shall argue that accommodating increasing complexity to provide a more realistic description of society does not necessarily demand accretion of model components and parameters. For example, when describing exchange networks it might be possible to conflate different categories of exchange (e.g. slaves, oil, pottery) under the single banner of elasticity of substitution. As another example, multiscale social networks might be reconfigured as effective single scale networks with a different understanding as to what constitutes information.

In summary, we shall argue that a primary-coloured model may be a better description of a multi-hued world than first appearances suggest if we choose our colours carefully.

3 DECODING OF FUNCTION - A CRITICAL GEOSPATIAL APPROACH

Author(s): Girotto, Chiara (Goethe University Frankfurt)

Presentation Format: Oral

The function and meaning of places are cognitive features of society, subjective, and often symbolic. However, in the absence of written sources research is based on traces acquired through material remains, settlement patterns, the environment, and human remains. Following Simmel, ideas of dominance in prehistory are spatially often connected to elevated locations and a theoretical framework of society and its indicators of economic and political power.

This chosen set of interest factors encodes perceptions on the meaning of features but also the intrinsic assumption of the applied algorithm to a seemingly objective spatial analysis. Moreover, most archaeological research focuses on homogeneous estimators, parametric functions, and non Bayesian probability approaches. Execution and Validation of explanatory analysis is as scarce as the application of non-parametric, inhomogeneous point processes.

This theoretical paper aims to challenge the traditional use of geostatistics in archaeology by exemplifying on the inability to reconstruct the function of Urnfield Culture hilltop settlements based on the associated theoretical framework of interest factors alleged in the literature. It highlights that spatial correlation, if it is even significant, does not imply causation in the absence of stable testable data. How can we deal with the special nature of archaeological data and variables without a priori assumptions to combine them with the power of spatial analysis?

4 GAPING THE BRIDGE: EVENT AND PROCESS IN LANDSCAPE ARCHAEOLOGY

Author(s): Kempf, Michael (University Freiburg)

Presentation Format: Oral

Events are triggers. Well, otherwise archaeology might be in a bad state. Events trigger processes? Or is it the other way around? Doesn't matter, we determine which interpretation we prefer as a narrative for change and development. We are creating the *longue durée*. Of course, constant development in the materialization of ideas and concepts are essential components for the interpretation of archaeologically relevant societies and their adaptation strategies to their immediate environment. But ultimately all innovations lead to collapse - either on the process-oriented axis of socio-economic parameters or because of short-term changes in environmental conditions. But what does short-term mean? And on which scales do event and process differ regarding the interpretation of social, cultural and economic changes? Despite their periodic recurrence, events are masked by long-term developments and are therefore not perceived as actual triggers. This is reflected in the classification and thus modeling of processes that simulate structures and patterns. In reality, they are simple adaptations to periodic events. This article aims to discuss the integration of long-term and short-term monitoring of landscapes and human behavior in terms of their impact on natural feedbacks.

5 FROM HOBBS, ROUSSEAU, AND MAUSS TO THE CARICATURE OF HUMANITY IN ARCHAEOLOGY

Author(s): Windler, Arne (German Mining Museum Bochum)

Presentation Format: Oral

Only a few books had a comparable impact on the archaeological research as Marcel Mauss' eminent 'Essai sur le don'. But since its publication, the connection between donator and receiver of a gift as well as the question of why gifts are returned are recurring topics in anthropology and sociology. The discussion about reciprocity can be condensed into a non-individualistic, normative and an egoistic, utilitarian notion - the modern dichotomy of altruism and egoism is omnipresent. While the concept of individualism is associated with Thomas Hobbes' 'Leviathan' and Adam Smith's 'free hand', the normative approach can be traced back to Jean-Jacques Rousseau.

This dichotomy is deeply embedded in Western thinking and can be identified in the archaeological literature on pre-modern economies: most interpretations of prehistoric exchange refer selectively to the non-individualistic views and/or apply the individualistic approach without any reflection. At the same time, authors stress that an application of the selfish approach is only possible for modern societies. As a consequence, archaeologists tend to characterise prehistoric actors as altruistic and cooperative, while modern (capitalistic) actors shall be egoistic and uncooperative. Humans are neither completely egoistic nor perfectly cooperative and if we want to deepen our understanding of prehistoric societies, we have to be aware of our reconstructions and models of past action. My lecture pleads for a stronger dialogue between both positions, a more reflective approach to the reconstruction of prehistoric actors, and an awareness of the limitations of both extreme positions.

6 THE INFORMATIONAL CAPACITY AND COMPLEX CULTURAL BEHAVIOR IN PREHISTORY

Author(s): Diachenko, Aleksandr (Institute of Archaeology of the NAS of Ukraine) - Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań)

Presentation Format: Oral

Archaeology approaches numerous issues of innovations spread, interaction and communication in prehistory through the set of quantitative approaches, mainly the graph theory and network analysis. The related applications usually include parametrized characteristics of agents (nodes), including their place in network structure, and intensiveness of interactions between them measured by the weighted edges. Questioning the most general properties of cultural dynamics in prehistory, this paper sup-

ported by the grant 2018/29/B/HS3/01201 from the National Science Centre of Poland aims at the introduction of a parameter 'informational capacity' into simulations. More specifically, the following issues are addressed. Can the information capacity be weighted or should it be involved into modelling as some unknown? How the informational capacity corresponds to systems of memory in prehistory? What social, economic and spatio-demographic parameters influence the increase or decrease in the informational capacity? The related tests make possible to link the culture theory and complexity theory, allowing the application of well-known models from the latter to archaeological data and re-framing the basic concepts of our discipline.

7 THE MYCENAEAN AEGEAN: NEGOTIATING TOO MUCH AND TOO LITTLE DATA

Author(s): Price, Henry (Imperial College London) - Gheorghiadu, Paula (University of Toronto) - Evans, Tim - Rivers, Ray (Imperial College)

Presentation Format: Oral

Archaeological data is so voluminous that it looks to be the 'big data' of contemporary usage while, paradoxically, it is too sparse when addressing particular questions to be simply representative. In fact, rather than 'big data' we have 'lots of stuff', much not usefully catalogued or just too poorly understood to fully address the problems in hand. Nonetheless, often we need the details of very few artefacts to make it possible to progress our understanding of some aspects of the large-scale behaviour of societies and their networks of interactions.

For example, despite the lack of systematic archaeological material, a recent attempt to model Phoenician Mediterranean interactions [1] makes use of little more than maritime geography to form the basis for comparison. This is an example of 'theory modelling' in which assumptions are made about the agency behind the formation of what, in practice, are exchange networks.

It is challenging to find a middle ground between theory modelling like the above and detailed structuring of data (data modelling), from which agency is inferred rather than assumed. In this talk we discuss one approach using a 13,000+ ceramic data set from Late Bronze Age (LBA) Crete put together by one of us (PG) from published catalogues.

This data is too much for generic theory modelling, but with only 1500+ ceramic entries identified as imports, also too little for true data modelling. Nonetheless, combining the data with geography, technology, assumptions about ceramic use and context, together with general network analysis provides a dynamic avenue through which to explore the role of key Cretan sites at this period.

J. D. Bakker, S. Maurer, J-S Pischke and F. Rauch, "Of Mice and Merchants: Trade and Growth in the Iron Age," The Centre For Economic Performance, Discussion Paper No. 1558, (July 2018): 1-56.

8 FORTS AND FARMS ON THE ROMAN FRONTIER: A TARGETED APPLICATION OF SITE LOCATION ANALYSIS

Author(s): Weaverdyck, Eli (University of Freiburg)

Presentation Format: Oral

Quantitative models that seek correlations between archaeological remains—traces of ancient behavior—and the environment have been attacked as de-humanizing and narrowly focused because they ignore influential factors that cannot be readily mapped and quantified, and can become environmentally deterministic. In fact, this critique helps to clarify the areas in which quantitative site-location modeling holds the greatest promise. Quantitative analysis aimed at addressing narrowly formulated questions about phenomena that are strongly constrained by geography can significantly advance our understanding of the ancient world. Taking an inductive approach that analyzes the changing correlations between archaeological remains and the environment in chronologically specific periods allows for an analysis of human-environment interaction that avoids environmental determinism. This paper describes a method of location analysis that investigates agricultural intensification on the Roman frontier and the potential role of military forts as market centers in the rural economy. Intensifying labor input in agriculture is constrained by the distance between settlements and fields, and the output of such a system is constrained by the physical character of the landscape; marketing practices that require frequent trips between the place of production and the place of exchange are heavily constrained by the distance between the two. Thus, both are susceptible to investigation through location analysis. The models presented here are not intended to be comprehensive accounts of all of the factors that influenced settlement location. Rather, they aim to contribute to specific debates about the economic impact of the Roman military in the frontier zone.

9 BORN OF THE CHAOS BEYOND PARADIGMS: A NEW SYNTHESIS IN ARCHAEOLOGICAL THEORY

Author(s): Giroto, Chiara (Goethe University Frankfurt) - Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Institute of Archaeology) - Rivers, Ray (Imperial College London) - Nakoinz, Oliver (Christian Albrechts University in Kiel)

Presentation Format: Oral

Current behavioural research often focuses on statistical reasoning based on a wide array of base data. Moreover, current development of archaeological theory is characterised by the range of coexisting paradigms, which marks the crisis of ideas. Modelling demands simplification therefore creating a caricature of the society. It is not only based on the researchers own theoretical background, but also deeply influenced by the perception of the organisational state of a society. Whilst embracing arte- and ecofacts as a reflection of complex behaviour their generative process, meaning and impact often remains unclear, disputable or is generally based in theory.

In past year's session no. 397: Modelling the past: Crisis of ideas in modern archaeology" we have seen multiple approaches to theoretical archaeological modelling. In this talk we aim to streamline our ideas and attempt to discuss how the middle ground between generic theory modelling and detailed structuring of data might look like in the future of archaeological theory. Summarising the two sessions we aim to lay the framework for a new synthesis which respects the explanative strengths of different paradigms and harnesses the integrative power of modelling.

208 GENDER AND TECHNOLOGY IN ARCHAEOLOGICAL STUDIES OF EVERYDAY LIFE (AGE SESSION)

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Chang, Claudia (Independent Scholar) - Franklin, Kathryn (University London Birkbeck) - Palincas, Nona (Institute of Archaeology, Bucharest)

Format: Regular session

Feminist Technology Studies (FTS) have contributed to science and technology studies by examining how tool-use, work, and object production reflect gender differences. A more radical feminist perspective would argue that technologies in fact produce or mediate those differences. Yet archaeological studies of tool-making and work which examine chaînes opératoires (steps in the process of making objects) and les techniques du corps or bodily practice often overlook the complex relationship between gender and technology. In this session we invite participants to question and challenge models that subordinate the roles of women in technological production; or, conversely, which minimize the cultural significance of 'feminine' or 'domestic' technologies and economies.

Archaeological research over the past several decades has demonstrated the centrality of technology in constructing historical ideas of gender, and of gendered ideologies in shaping archaeological approaches to politics, economy, architecture, and other spheres tied to technology. In particular, the concept of gynotechnics, referring to the ways that the labor of women constructed not only their embodied identities as women, but the moral universe of their society as well. We would extend the scope of this concept and invite session participants to investigate archaeological case studies of cosmotechnics: the role of technologies in constructing interlocking cosmologies at the scale of body, personhood, gender, space, and society. We aim for a session that problematizes the intersection of gender and technology in the multiple modes described above. We will examine both the important role of domestic/household/ "feminine" technological productions of cloth, pots, cooking and even reproduction within larger symbolic, ideological, and political contexts of ancient societies.

ABSTRACTS

1 POTTERY PRODUCTION AND FEMININITIES IN THE LATE BRONZE AGE IN THE LOWER DANUBE (APPROX. 1550-1350 CAL BC)

Author(s): Palincas, Nona (Vasile Parvan Institute of Archaeology)

Presentation Format: Oral

The aim of this talk is to analyze the intertwining of pottery production and the construction of a femininities in the Late Bronze Age (approx. 1550-1350 cal BC) in the region between the Southern Carpathians and the Lower Danube. The analysis is based on the stylistic and contextual analysis of artefacts as well as on ceramic archaeometry.

The stylistic and contextual analysis of artefacts indicate that the spheres of femininity and masculinity had been clearly separated at the level of ideology at least since the later Middle Bronze Age, with masculinity associated with group leadership, warfare and outdoor labor and femininity associated with the domestic sphere, and in particular with pottery production, cooking, serving food and fashionable table manners as well as with the production of cloth.

The stylistic analysis of the Late Bronze Age pottery indicates that this was probably the main medium for the renegotiation of gender relations. This included the assertion of a higher status for (some) women (and a consequently an overt challenging of male authority), as seen from the introduction of gynomorphic symbols in pottery decoration alongside long established sun cult related symbols.

Recent technological analysis of ceramics suggests that while in some areas this was produced by local potters, in others it was made by itinerant potters, in contradistinction to the women-at-home ideology.

In addition to the aforementioned sets of data, this paper will resort to the concepts of gynotechnics and cosmotechnics in an attempt to explain how a new type of femininity emerged in connection to pottery production and the use of old and new religious symbolism.

2 AU FIL DU TEMPS. ABOUT REAL CLOTHING AND SYMBOLIC IN THE BRONZE AGE AND THE IRON AGE

Author(s): Yann, Lorin (INRAP - National Institute for Preventive Archaeological Research; Université Charles de Gaulle - Lille Laboratoire Halma - UMR 8164)

Presentation Format: Oral

This paper will discuss the role of female weavers in protohistorical society and in the imagination associated with it. The French

furniture of textile craftsmanship (loom weights, spindles whorls, combs...) is examined and the analysis of its design and iconography makes it possible to understand its representation in the set (belts, fibulae, pins...) based on European comparisons.

All common textile objects or their figurative forms are considered as a cultural expression that plays a key role in the creation and transmission of the dominant ideology, very well established in the societies of protohistoric Europe, using recurrent imagery (the solar pattern associated with weaving) and of which the weavers are the representatives.

The motifs of the solar loom or spindle whorls enhance the objects with their characteristic shapes and are also used as an ornament for clothing. These motifs can have a religious significance (divine patronage) or an economic and social significance (privileged character of textile craftsmanship...).

In both cases, textiles play an important role in the imagination, over the continent and over time. The iconography of the loom theme is perennial, but its formal evolution could be indicative of societal transformations.

Indeed, the role of women in this creative effervescence could go hand in hand with their growing role in society. We will therefore seek to clarify it, both on a productive level in the context of textile craftsmanship, as well as on a symbolic level.

3 FOOD TECHNOLOGY AND THE GENDERED COSMOLOGIES OF ROCK ART IN CENTRAL EURASIA

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

Presentation Format: Oral

An ever-increasing number of scholars are publishing scientific analyses of faunal remains from Bronze and Iron Age Central Eurasia. These analyses give us some insights into herd management techniques and overall consumption patterns of both animals and humans. However, the analyses are not yet at a scale to allow us to distinguish differences within communities. Who was responsible for procuring the food, and who was responsible for cooking it? Answering this question by analogy to ethnographic accounts of food production and consumption uncritically foists modern gender dynamics onto past societies and past organizations of space. It may be that the analogy holds, but it is worth examining other lines of evidence to test whether or not it does. Luckily, there are a number of studies of the rock art of Central Eurasia, and many of these studies speculate on the cosmologies of Bronze Age and Iron Age societies. In fact, much has been written about the relationship between spirits, the hunt, and fertility and reproduction. I argue that extant analyses of rock art cosmologies may be used as another line of evidence to help understand the domestic technologies of food production, and the interpersonal relationships behind those technologies. In this paper, I make a preliminary survey of published analyses of faunal remains from Bronze and Iron Age Central Eurasia, and link those analyses to local rock art cosmologies.

4 THE DOMESTIC AND THE DEAD: RETHINKING GENDER REPRESENTATION IN PONTIC SCYTHIAN PERIOD IRON AGE BURIALS

Author(s): Johnson, James (University of Wyoming)

Presentation Format: Oral

Funerary technology, including but not necessarily limited to burial mounds and grave goods are still seen as direct reflections of Eurasian Iron Age social structure and the gender identities that are seen to be encompassed by it. The scholarly focus on single, often anomalous, massive burial mounds and the types and amount of their interred grave goods, such as Alexandropol or Tolstaya Mogila in present-day south-central Ukraine, skew our senses of how gender and the 'produced' nature of funerary technology and their aesthetics are inextricably intertwined and their importance in the numerous cosmologies that operate in society. Few studies of Eurasian Iron Age mortuary practices explore critically how a different approach utilizing the lens of production, in both a performative/theatrical sense and technological sense, might reveal hidden political and cosmological facets of Iron Age sociality.

I draw upon equally Judith Butler's (2004) gender constitution as performative and Susan Stewart's (2007) notion of the 'remarkable' (elements of identification chosen to be indexical of certain periods and events assigned to individuals) to demonstrate how Iron Age burials were steeped in political intentionality, manifested gendered power relations through the use of gynotechnics, and ultimately conveyed a sense of morality and being-in-the-based on ideas of the 'domestic' that are often overlooked or ignored. During the course of the presentation, I explore the remarkable nature of Pontic Iron Age social action as related to funerary practices through a careful disassembling and reassembling of grave good assemblages, mound construction, and mortuary landscapes. Utilizing data gleaned from a modest population of mounds and burials from across south-central Ukraine, I focus in particular on how burials and funerary activities were produced and intentionally manipulated as means to legitimize, and reinforce, the cosmological and social ordering of Pontic Iron Age communities through carefully designed and produced aesthetic displays.

5 COSMOTECHNICS AND SILK ROAD WORLDS: TECHNOLOGIES OF WORLDLY BODIES

Author(s): Franklin, Kathryn (Birkbeck, University of London)

Presentation Format: Oral

In this paper I examine the role of techniques and technologies in constructing the medieval Silk Road. I will explore the implications of exploring the potentials of technology to mediate worldview, and to situate gendered bodies within worlds of possible action and efficacy. Specifically, I will review technologies of the body-- clothing, cooking and eating-- as they served to orient

people in what is now Armenia within political relationships and cultural spaces. The paper will tack between historical, material, epigraphic and landscape data, considering the ways that both 'everyday things' and ritual objects/spaces collaborate in the making of material worlds. This conversation will center on the valleys of Vayoc' Dzor in southern Armenia, but will, through the scalar jumps enabled by material cultures, reflect on Mongol statecraft and broader Central Asian topographies of taste. The paper will develop the idea of <cosmotechics,> or technologies (including practices) which function both to constitute embodied subjects, and to orient those subjects within a world that makes sense. At its broadest scale, this paper considers the broader role of cosmotechics in knotting together the worlds of the medieval Silk Road.

6 THE 'WRENS OF THE CURRAGH': AN ARCHAEOLOGY OF PROSTITUTES AND CAMP-FOLLOWERS IN NINETEENTH-CENTURY IRELAND

Author(s): Campbell, Eve (Independent) - O'Gorman, Laura (Centre for Gender and Women's Studies, Trinity College Dublin) - Rice, Kim (Independent) - McDermott, Siobhán (Centre for Archaeological Fieldwork, Queen's University Belfast)

Presentation Format: Oral

Based on the plains of Kildare, the Curragh was the largest military camp in nineteenth-century Ireland. From the 1850s, the camp was noted for a community of women who built a make-shift settlement adjacent to the military establishment. Colloquially known as 'wrens' because of their sod- and furze-built dwellings, the group of women included prostitutes, soldiers' wives, harvest workers, and their children. The women occupied a fraught position; tacitly accepted by the military for the services they provided, while simultaneously being the subject of revulsion and moral panic. They eked a precarious existence, fashioning homes from the earth of the plain and building-scrap scavenged from the military camp. Where contemporary accounts of the women are largely penned by bourgeois reformers, this project seeks to use archaeology as a way to move toward a more emic understanding of their existence, focusing on the creation of alternative domesticities, and practices of solidarity and mutual care.

7 POCKET COMPANION FOR THE FANCY: AN ARCHAEOLOGICAL MATERIALITY OF SEXUAL EXPRESSION

Author(s): O'Gorman, Laura (Centre for Gender and Women's Studies, Trinity College Dublin)

Presentation Format: Oral

The negotiation and participation of all genders in illicit sexual congress after the American Revolution and into the nineteenth-century is viewed here through the brothel guide, *A Guide to the Stranger*. By the nineteenth-century, Philadelphia was one of the fastest growing cities in America, in which prostitution burgeoned alongside industrial development. Technological advances such as the printing press and paper wrappers made of straw meant that low cost books could be manufactured on a mass scale. Nineteenth-century sexual material culture in the form of licentious and sexually explicit literature challenged not only social change, but also the government's role in the intimate and private lives of individuals. Brothel directories are usually treated as curiosities, but as material objects they provide a unique insight into the lives of women historically marginalised. Brothel directories as objects embodied the essence of this illicit consumption and presented strangers and the uninitiated with a guide to enjoy metropolitan sexual escapades. While mainly directed at men, the guide acknowledged women's participation in Philadelphia's pleasure culture as well.

8 GENDERED UNIVERSES: FEASTING NOW AND THEN---SERVING VESSELS IN CONTEMPORARY KAZAKH CONTEXTS AND AT THE IRON AGE SITE OF TUZUSAI

Author(s): Chang, Claudia (Independent scholar) - Zak, Claire (Texas A & M Nautical Archaeology Program)

Presentation Format: Oral

Pottery vessels, long associated with women's work, also enter into the domain of female domesticity when associated with the presentation and serving of food in ritual contexts. Through ethnographic analogy and the analysis of archaeological ceramic data, we address the broad question of how women's work represents both household wealth, social ability to demonstrate hospitality, and ultimately the symbolic power women held in the domestic household over ceramic technology and its uses in ritual contexts. In contemporary Kazakh contexts, the presentation of the main dish is placed in the center of the table or in front of the most honored guests, while individual place settings of small plates and tea bowls are arranged, usually using the best China pieces owned by the household. All this must be orchestrated by the head woman and her daughters, sisters and other related women.

Detailed studies of the technology and typology of ceramic vessels at Tuzusai, an agro-pastoral Iron Age site in southeastern Kazakhstan conducted by Zak in 2018 also show a differentiation of vessel sizes (pot diameters) and forms related to ritual feasting events. We conjecture that the production, use, and exchange of these fineware and/or slipped and sometimes painted vessels also represent the gynotechnics of a nomadic tradition steeped in the serving of meat, milk, and grain products.

9 THE BEAUTY AND THE EXCAVATOR. IMAGES OF ARCHAEOLOGY AND THEIR INFLUENCE ON SELF-PERCEPTION, CAREERS, AND HOW WE WORK

Author(s): Fries, Jana (Niedersächsisches Landesamt für Denkmalpflege)

Presentation Format: Oral

The public image of archaeologists is far from our professional everyday reality. In fact many complain about the "Indiana Jones"

image used to portray archaeologists, especially among the general public and the media. In this paper I argue that our professional identity is closer to that “Indiana Jones” public image than we realize or wish to admit. This fact poses some problematic gendered aspects of archaeological practice. I will explore how fieldwork and excavations have been defined historically as the core of our profession and why women were excluded from fieldwork longer than from other aspects of the archaeological profession. Fieldwork as a gendered set of technical and methodological skills reinforced certain visual representations of women’s participation in archaeology. This has had a negative effect on women’s employment in archaeology. These gendered notions of skills, techniques, and methods employed by field archaeologists has also influenced the kinds of topics and research conducted by women archaeologists in the past and present.

Finally, I shall analyse how (young) archaeologists present their work in such a way to reinforce gendered stereotypes through visual representations (photographs) and in social media.

209 DO WE STILL NEED LA TÈNE? PERSPECTIVES FROM THE MARGINS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Fernández-Götz, Manuel (University of Edinburgh) - Potrebica, Hrvoje (University of Zagreb) - Črešnar, Matija (University of Ljubljana)

Format: Regular session

The concept of a La Tène period – soon conceptualised in terms of a ‘culture’ and frequently equated with an alleged ‘Celtic’ ethnicity – has been a fundamental element of archaeological narratives for over a century. As the EAA annual meeting moves for the first time to Switzerland, the home of the eponymous archaeological site of La Tène, it is a good occasion to revisit this influential concept and how it has shaped (and still shapes) Iron Age interpretations and practices. This session invites proposals that rethink some of the main elements linked to the La Tène concept, from chronologies to migrations and models of cultural contact. In particular – but not exclusively –, we invite papers that take a critical look at the concept from the ‘margins’, i.e. areas such as south-eastern Europe, northern Germany, Britain and Iberia that have traditionally been regarded as peripheral. How can we move away from these core-periphery models? How did artistic styles spread and develop? What do we mean by “latènisation”, and how did it work (if it did)? And what lessons can we learn from the margins in order to reconceptualise the very foundations of the La Tène concept and to develop alternatives?

ABSTRACTS

1 A HISTORIOGRAPHY OF LA TÈNE

Author(s): Collis, John, Ralph (University of Sheffield)

Presentation Format: Oral

In my contribution I want to present the historiographic background to the session, how interpretations moved from Keller’s original statement that the finds from La Tène had nothing to do with the Celts, to the late 20th century claims that the origin and spread of the Celts can be documented by the ‘spread’ of a ‘La Tène Culture Group’ from southern Germany, and why this is now rejected. It will briefly deal with the change in Keller’s opinion in the 1860s, but why La Tène was not accepted on the continent until Déchelette in 1914. The concept of La Tène Art is a British invention starting in the 1850s and 1860s with Daniel Wilson, Westwood, Kemble and Franks, and later in the century by Arthur Evans, Romilly Allen and Reginald Smith. Déchelette linked Evans’ idea of the origin of Celtic Art in southern Germany in the 5th century BC with d’Arbois de Jubainville’s linguistic interpretation of the eastward spread of the Celts. In the 1940s Jacobsthal changed the nomenclature, ‘Late Keltic Art’ becoming ‘Early Celtic Art’ and the spread of the Art was then linked with the Celts by Pierre-Marie Duval and the Megaws, a view that dominated into the 1990s. This ‘Culture Historical’ interpretation has been under attack since the 1980s, but it still frequently occurs in popular books and museum exhibitions. The different uses of terms such as La Tène and Hallstatt as both chronological and cultural has added to the confusion.

2 DECONSTRUCTING CONCEPTUAL FRAMEWORKS IN IRON AGE RESEARCH

Author(s): Fernández-Götz, Manuel (University of Edinburgh)

Presentation Format: Oral

The dominant paradigms of Iron Age archaeology in temperate Europe are built around the notions of Hallstatt and La Tène as chronological and cultural entities. These definitions have been constructed in Central Europe since the late 19th century and became relevant for wider regions in the continent due to the early date of the discoveries and the strength of the mainstream archaeological tradition developed by German scholars such as P. Reinecke. However, the current use of these terms is sometimes highly problematic, particularly when they are applied to regions that are “peripheral” to the alleged “core” in which the models originated. Ultimately, many of the assumptions are based on an uncritical application of “core” – “periphery” models. The standard Hallstatt and La Tène chronologies often do not work for other regions of temperate Europe where they obscure more than they reveal, and this also heavily affects our socio-historical interpretations. In this paper, I will highlight some of the main issues and argue that a renewed look at Iberia and Britain can help us to reassess interpretations not only about the margins, but

also about phenomena in the supposed Central European core areas.

3 THE OSCILLATING RELEVANCE OF LA TÈNE IN BRITISH IRON AGE CHRONOLOGY

Author(s): Adams, Sophia (University of Glasgow)

Presentation Format: Oral

La Tène: a chronology that lives beyond the site, beyond regional and national boundaries; a term that conjures images of swirling ambiguous imagery, fine metalwork and shining pots. In Britain the term describes artefacts of apparently comparative date, in particular brooches. La Tène I brooches have strong affinities with examples from the type site and on the near continent. In contrast the La Tène II style brooches are often exceedingly different from their apparently contemporary counterparts in France, Belgium, Germany and Switzerland. Yet the proposed stylistic connections between these regions have been used to create the chronology of these artefacts in Britain; organised into period boundaries, bracketed by calendar years. In turn these stylistically dated brooches have been used as evidence to date features and sites.

It is only in recent years that radiocarbon dates have been obtained for human and animal remains found with the brooches, but these are often considered as subsidiary evidence owing to the limitations in the calibration curve. At SUERC, University of Glasgow, Dr Derek Hamilton and I are redressing this situation to explore brooch chronology starting from the radiocarbon dates. We are undertaking a large-scale programme of sampling articulated burials and animal remains that have been deposited in the same archaeological context as Iron Age brooches. These dates will provide an independent chronology that may transcend geographical, temporal and culture-historical boundaries. Data which we can compare back to the data from Continental Europe. The margins informing the origins perhaps? This paper discusses the implications of our research on existing chronological sequences. It examines the issues of using La Tène typologies in creating the basis of Bayesian models. With La Tène providing the platform, the brooches providing the structure and the radiocarbon dates the foundation, can we revise our regional Iron Age chronologies?

4 FRINGE CELTS – SOUTH-EAST EUROPEAN PERSPECTIVE ON THE LA TÈNE CULTURE

Author(s): Potrebica, Hrvoje (Dept of archaeology)

Presentation Format: Oral

While concept of 'Celts' emerged from the Western Hallstatt Circle as more or less result of cultural evolution, in the south-east Europe it was more contextual than chronological shift. The context and semantic value of the Early La Tène finds in this area is quite different than in the central 'Celtic' area. Furthermore, the mechanism of transfer and integration of the Early La Tène elements into local cultures is significantly different from the process that takes place in later periods of the Late Iron Age. In later periods La Tène communities in this area are considered to be mixture of local people and incoming groups that were recognized as 'Celts'. The situation is even more complicated if we have in mind that both 'locals' as well as incoming 'Celts', were to some extent exposed to the La Tène Culture before they were merged into compact and recognisable cultural item. 'Celtization' and 'Latenization' are in this area significantly different concepts. It even seems that these are nothing more than processual categories, each of them comprising of at least several models.

5 WHAT IS OLD, WHAT NEW AND WHERE TO DRAW THE LINE CONSIDERING (LATE)HALLSTATT AND LA TÈNE SOUTHEAST OF THE ALPS?

Author(s): Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia)

Presentation Format: Oral

One graphite sherd with a thickened rim found on any archaeological site in Slovenia and the site is automatically and without any doubt declared as Celtic... "Pots are not people" is being said over and over again. But, the ghosts of pots, fibulae, swords etc. are often shaping the way we see the ancient populations in over-simplified ways.

However, there are also sites, which are opening our eyes and letting us observe the changes, which occur when the emerging "La Tène culture" meets the established traditional world of the "Eastern Hallstatt circle" on the south-eastern edge of the Alps. Moreover, sites differ one from another and there is no general recipe, based on which some things change and others persist in their traditional form.

Studying the south-eastern outskirts of the Alps, i.e. the "margins" of the La Tène world, is in a way not very beneficial, as very little is "as it should be". But the view from the borders is therefore maybe less distracted...

6 THE LA TÈNE PERIOD IN BELGIUM. HOW CELTIC WAS THE LOCAL POPULATION?

Author(s): De Mulder, Guy (Ghent University)

Presentation Format: Oral

Belgium is located at the fringe of the so-called Celtic core area in Central Europe. This is already reflected in the use by 19th and 20th century researchers of the terms Celtic or Germano-Celtic to describe the Late Iron Age material culture. Looking at the Belgian archaeological record the question arises how to define Celtic La Tène culture. The most visible elements are limited to expressions of status as some finds on the 5th century site Kemmelberg and the rich burials of Eigenbilzen and Meeuwen-Grutrode. Other La Tène burials contains sporadically artefacts related to Celtic style. The question arises of this Celtic 'identity' in Belgium is limited to an elite group?

One exception is the so-called 'Ardennes group' in southern Belgium. This group is best known by its burial site which contain two-wheeled chariots and grave goods that can be related to the Champagne-Marne region in French. The strong cultural links between the two regions have led to the suggestion of a potential immigration in the Ardennes region.

An interesting element in this discussion are the language studies by Gyssels and Van Durme. They state in their studies that the protohistoric language in Belgium was a conservative remnant of the Indo-European group, it so-called 'Belgic' or 'language of the northwest group'. Celtic language traces are almost absent while there are indications of a germanization process of this language during the Iron Age. This is also reflected in the writing of classical authors who are referring to Germanic ancestry for the local tribes in Belgium.

7 ON THE LATÈNISATION OF EARLY LA TÈNE ELITE CULTURE IN THE LOWER RHINE/MEUSE REGION

Author(s): Roijmans, Nico (Free University Amsterdam)

Presentation Format: Oral

The Lower Rhine/Meuse region of the Southern Netherlands and Northeast Belgium has a small cluster of Early La Tène elite burials, characterized by the deposition of bronze vessels, two-wheeled vehicles, horse harnesses, and often also weapons. This group of burials forms the most northern off-shoot on the continent of an elite culture that has its origin in the Middle Rhine/Moselle region and the Aisne/Marne region in Northern France.

The material culture of the graves informs us about elite connectivity in the 5th century BC when sets of prestigious objects were imported from southern regions. The term 'latènisation' can be a useful concept here. It refers to a process of appropriation and creative interpretation by local individuals and groups of La Tène material culture and associated values and social practices. This definition enables us to understand the northward diffusion of La Tène elite culture in a more neutral and flexible way, without making an appeal to the problematic discourse of Celtic ethnicity and core-periphery models.

A first analysis of the evidence allows some interesting observations:

- elites in our study area adopted southern burial practices and associated material culture, but also gave it a 'couleur locale' by integrating it into a cremation ritual.
- the influx of southern material culture should not only be explained in terms of exchange relations. Recent strontium-isotope research of a small group of inhumation burials from the Dutch river area (Kookter et al. 2017) points to a heterogeneous composition of the population with evidence for immigration.
- the tradition of Early La Tène elite burials seems to have been a short-lived phenomenon in our study area, already breaking off in La Tène A. There is no evidence that cemeteries containing elite burials continued into La Tène C/D.

A. THE INVASION OF CELTS IN DARDANIA, THE DATA OF ANCIENT AUTHORS AND ARCHAEOLOGICAL FINDS (THE CASE OF CËRNICA)

Author(s): Baraliu, Sedat (Faculty of Education; Faculty of Philosophy-Department of Anthropology) - Alaj, Premtim (Archaeological Institute of Kosovo)

Presentation Format: Poster

One of the most important events in the history of the Dardan kingdom was undoubtedly the invasion of the Celts. It should be noted that archaeological records are very poor on the Celtic invasion in the territory of Dardania. The first evidence recorded of this invasion is from ancient authors. Appianus, Justinus, Livius, Diodorus, Polybius, Pausania, who wrote about the Celt invasion of Dardania. The study in question is more about the invasion of 280 BC, when the Celt army were divided into three parts. In this study, we will only treat the part of the Celtic army, which under the leadership of Bolgios attacked Macedonia and Illyria. During this march, following the defeat of Macedonia under the leadership of Ptolemy Ceraun, the Celts army crossed the territory of Dardania, at which point destroyed some Dardanian settlements. For this invasion, archaeological data is scarce, as the Dardanian territory is explored very little. But during 2016-2018, under the leadership of the Archaeological Institute of Kosovo, excavations were carried out at the Iron age settlement of Cërnica (Gjilan, Kosovo). This excavation has provided us with some important data that can testify the Celtic Invasion of Dardania. During the excavations, an archaeological layer was discovered which proves that the settlement was destroyed. This layer coincides in the archaeological context with the Invasion of the Celts. This is also confirmed by some archaeological findings that have Celtic origin. It is also worth mentioning that the settlement of Cërnica is close to the Macedonian border and is located near the Binça river, which is a branch of Morava river. It is assumed that the Celts followed exactly the flow of the Vardar and Morava streams to penetrate inside Illyria.

210 METHODOLOGICAL DEVELOPMENTS IN FUNERARY TAPHONOMY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Mickleburgh, Hayley (Independent; Texas State University) - Alfsdotter, Clara - Nilsson Stutz, Liv (Linnaeus University)

Format: Regular session

Taphonomy has been an emerging field since the 1940s, with an increased focus on method and development from the 1980s onwards. Funerary taphonomy provides taphonomic evidence of the treatment of the dead, yielding exceptionally detailed information on mortuary practice in the past. Careful consideration of taphonomic evidence and integration with theoretical devel-

opments in the field of the archaeology of death and burial can shed light on the rich spectrum of human responses to death and interactions with the dead body in past societies. This session aims to bring together perspectives on a wide range of taphonomic methods that can be used to increase our understanding of the broad scope of variation in the treatment of the dead. By inviting papers with a strong basis in both empirical data and social theory, the session strives to transcend the disciplinary divide between the humanities and natural sciences in the study of archaeological mortuary contexts.

Research papers discussing recent developments within fields such as archaeoethanatology, digital archaeology, histotaphonomy, biotaphonomy, geotaphonomy, actualistic studies of cadavers and forensic archaeology, with the aim to improve, evaluate and/or standardize existing methods applied to the taphonomic study of human mortuary contexts are particularly encouraged. We invite authors to actively reflect on how these new insights can contribute to our understanding of mortuary practices in the past.

ABSTRACTS

1 FUNERARY TAPHONOMY AS A KEY TO THE SOCIAL BIOARCHAEOLOGY OF THE MYCENAEAN PERIOD

Author(s): Moutafi, Ioanna (University of Cambridge)

Presentation Format: Oral

The onset of the Late Bronze Age in the Greek mainland (ca. 1700 BC) saw significant changes in the mortuary customs, closely related to the wider socio-political developments of the period and the emergence of 'Mycenaean' societies. The most distinctive change was a shift from single inhumations to collective burials, a custom that prevailed through the entire palatial Mycenaean era (1500-1200 BC), undergoing its final transformation in post-palatial times (1200-1050 BC). Despite the growing interest of archaeological research in the social dimensions of Mycenaean collective burials, truly integrative bioarchaeological approaches are still rare. As a result, funerary activities, particularly the treatment of the body, are only partially reconstructed. A wide variety of specific acts are often lumped under the term 'collective burial', while, in fact, they may reflect rather different ideological notions. The issue is further complicated due to inherent problems of the taphonomic record of collective tombs, and the special challenges in discerning temporal variation of the secondary acts within a tomb.

This paper investigates the complex relationship between funerary treatment and wider social dynamics, based on a multidisciplinary taphonomic approach to human skeletal remains and associated mortuary data. This approach integrates up-to-date theoretical reflection in mortuary archaeology with scientific advances in the study of collective skeletal assemblages. Discussing a large body of bioarchaeological data from the Late Bronze Age chamber tomb cemetery of Voudeni, Achaea, Greece, it will be shown that even subtle changes in collective burial rites often represent meaningful social acts. Therefore, funerary taphonomy is essential for a detailed and accurate reconstruction of mortuary practices and their associated social meanings.

2 THE LOST PHOTOS. ARCHAEOETHANATOLOGY APPLIED TO PHOTO DOCUMENTATION FROM THE 1960S REVEALS NEW DATA ABOUT MESOLITHIC BURIALS, SADO VALLEY, PORTUGAL

Author(s): Peyroteo Stjerna, Rita (Human Evolution, Dep Organismal Biology, Uppsala University; UNIARQ, Centro de Arqueologia da Universidade de Lisboa) - Nilsson Stutz, Liv (Department of Cultural Sciences, Linnaeus University) - Cardoso, João Luís (Universidade Aberta; ICArEHB, University of Algarve)

Presentation Format: Oral

The Mesolithic shell middens in Portugal aggregate some of the largest and earliest burial grounds known, around 8000 years old, arranged and maintained by populations with an exclusive hunting, fishing, and foraging lifestyle. The archaeological material is housed in museums and consists of artefacts, field documentation (written, graphic) and more than 300 human skeletons. This archaeological assemblage is exceptional due to its quality and antiquity, but its early excavation introduces several challenges to the modern research.

Here we present an analysis of the burials in the shell middens of Arapouco and Poças de S. Bento in the Sado valley, Portugal following the principles of archaeoethanatology to reconstruct past ritual practices as responses to death. Our analysis was based on unpublished photographs from the 1960s and our aims were 1) to identify the nature of the deposits (primary, secondary); 2) to describe the space of decomposition of the cadaver (filled, empty, mixed); 3) to reconstruct the initial position of the cadaver in the feature; 4) to reconstruct the grave features, such as size and shape; 5) to detect the initial presence of perishable materials deposited along with the cadaver, such as structures behind the bodies, or wrappings of the body at the time of disposal; 6) to clearly define the deposits containing more than one individual; 7) to identify post-depositional manipulations of the cadaver. The method, which emerged in the context of field archaeology lays great emphasis on the field situation and it has been argued that assessment of the material may not be possible if key observations are not documented in situ. Despite the limitations, we demonstrate with this case study that archaeoethanatology is a robust and reliable method to assess, study, and retrieve new data from the extensive archaeological assemblages of human remains available in museums.

- 3** **EVALUATION OF SKELETAL DISARTICULATION IN VOID DEPOSITIONS THROUGH HUMAN TAPHONOMY PILOT STUDY**
Author(s): Alfsdotter, Clara (Linnaeus University; Bohusläns museum)
Presentation Format: Oral
- The author has conducted human taphonomic research at the Forensic Anthropology Center at Texas State University (FACTS). The preliminary results, and possible implications for funerary archaeology, is presented in this paper.
- Following uncharacteristic patterns of skeletal articulation in void depositions of human remains in Iron Age ringfort in Scandinavia, experimental research has been conducted to test the hypothesis that skeletal disarticulation patterns proposed for void burials in archaeoethanatology might be container reliant. Three voluntarily donated human cadavers were placed in a supine position in coffins (two, of which one was observable) and a larger over ground container (one donation). Variations in decomposition patterns is presented. The skeletal disarticulation is discussed in relationship to the, through archaeoethanatology, often observed void disarticulation pattern.
- The study empathizes human decomposition processes that needs to be regarded in the study of human skeletal (dis)articulation in void depositions. The research aims at improving the understanding of site formation process in regards to human remains.
- 4** **UNDERSTANDING HUMAN BURIAL TAPHONOMY THROUGH ACTUALISTIC EXPERIMENTS AND 3D DATA COLLECTION AND ANALYSIS TECHNIQUES**
Author(s): Mickleburgh, Hayley (Forensic Anthropology Center Texas State University) - Klinkenberg, Victor (Faculty of Archaeology Leiden University) - Gluschitz, Sarah (St. George's University Grenada)
Presentation Format: Oral
- This paper presents some results of an ongoing actualistic experimental study of human decomposition and skeletal disarticulation at an outdoor human decomposition facility in Texas. Taphonomic data on the natural sequence of joint disarticulation and spatial distribution of bones in buried and surface depositions of 20 willed-donated human cadavers were collected (2015-present). The results are used to examine taphonomic models used in archaeoethanatology, a field of study in archaeology that aims to reconstruct mortuary practices in the past. Archaeoethanatology uses a model of the relative sequence of natural joint disarticulation during decomposition and the spatial configuration of the bones in the burial environment to distinguish natural processes from mortuary treatment. Actualistic experiments provide the possibility to assess the effects of different variables on joint disarticulation and bone movement under controlled conditions, allowing us to improve existing models and develop new taphonomic methods for studying mortuary treatment.
- In this paper, we present the methods and workflow we developed for the documentation and analysis of human decomposition and burial taphonomy (taphonomy of the grave) in the actualistic experimental project. We discuss how we used Structure from Motion photogrammetry, 3D animation, and 3D GIS to visualize complex taphonomic processes and collect quantitative data on bone movement throughout decomposition. Our method produces highly detailed information on the spatial relation of human remains and other objects within the burial environment. The use of this method across a larger sample will provide measurements which could potentially yield 'signature' disarticulation patterns related to specific variables (i.e. natural or human). The collection of further actualistic data in this ongoing experimental project will provide a significant source of taphonomic data for mortuary archaeology.
- 5** **HUMAN DECOMPOSITION IN NORTHERN CROATIAN LITTORAL**
Author(s): Petaros, Anja (National Board of Forensic Medicine in Sweden, Linköping) - Hranilovic, Anja (Rijeka University, Faculty of Medicine) - Stemberga, Valter (Department of Forensic Medicine and Criminalistics, Rijeka University)
Presentation Format: Oral
- Human decomposition and taphonomy represent an important research area within forensic anthropology, archaeology and pathology. This study presents the retrospective analysis of human decomposition pattern in the Northern Croatian Littoral in five different conditions: outdoor and indoor settings, water, hanging and burial. Autopsy reports of 249 bodies showing advanced postmortem changes autopsied at the Department of Forensic Medicine and Criminalistics, Rijeka, Croatia have been examined with regard to the approximate postmortem interval (PMI) (1st week/1st month/ 1-6 months/ >6 months), decomposition stage (initial and advanced postmortem changes, skeletonization, mummification and adipocere formation) and season. A special emphasis was given to the characteristics of skeletonization and mummification in the region. The results confirmed the significant correlation between PMI and decomposition pattern with skeletonization and mummification observed in corpses with a PMI longer than 1 month. The highest ratio of mummification was found in corpses found indoors and in hanged victims. Skeletonization was observed most in bodies found outdoors, while saponification in those found in water and in buried corpses. Besides presenting the decomposition pattern of autopsied forensic cases, a short overview of the recovery of remains pertaining to a 20th century cemetery burial will be offered which will allow comparison of the forensic and cemeterial decomposition pattern in the same region. The different patterns and rate of progress of human decomposition which are significantly related to regional specific climate, soil composition, regional flora and fauna, can greatly affect the way the body is presented at recovery since they can alter the speed of disarticulation, disarticulation pattern and body position at recovery which are important features to take in consideration when interpreting both modern and archeological burials.

6 HANDLE THE ANCESTOR: THE MDCT TECHNOLOGY APPLIED TO RECONSTRUCT THE FUNERARY RITUAL OF INCINERATION
Author(s): Innocenti, Dario - Cavalli, Fabio (Research Unit of Paleoradiology and Allied Sciences, SCIT "Ospedali Riuniti" Trieste)
Presentation Format: Oral

Ancient cremated remains are, notwithstanding the modern technologies, one of the major challenges of funerary archaeology. Cremation is a funerary practice characterised by many actions and rituals that, at least in ancient historical sources, were strictly regulated. Despite many of these actions are not identifiable today, cremated remains can still be analysed under the taphonomical and tanatological aspect. At the date, the study of cinerary urns through the micro-excavation implies several technical and practical difficulties, related to the incredibly fragile nature of the materials and the problems connected with their documentation.

With the purpose of preventing these problems, since few years now the exploitation of MDCT technology is used to verify the presence of grave goods and bones fragments inside the urn. After having verified the validity of this methodology, it has been decided to use the MDCT to recognize the taphonomical characteristics of a cinerary urn, trying to reconstruct the different rituals that took place in antiquity.

This paper will present our research on ancient cinerary urns with MDCT and will suggest a new methodological approach to study the ancient cineraries with a completely non-destructive technique.

For this purpose more than 60 cinerary urns from different geographical and chronological areas have been analysed with MDCT. This paper will consider many different cases, paying attention to the depositional and post-depositional processes that can be recognized through the analysis of the relative density of the materials contained inside the urn, their stratigraphic disposition and also delimiting and valuing the interfaces between them. This analysis can permit to identify the gestures connected with the funerary ritual from post depositional taphonomic actions.

To validate the proposed methodology will be discussed the preliminary results obtained through the realization of an experimental urn created and analysed in laboratory.

7 ROLE AND IMPACT OF DECAY PROCESS IN BURIAL PRACTICES ANALYSIS
Author(s): Bouquin, Denis (Service archéologique du Grand Reims; LABO Université Libre de Bruxelles)
Presentation Format: Oral

The skeleton is a consequence of the decay process, which is a complex and multiparametric phenomenon. In archaeological contexts, the reconstruction of burial practices is essentially based on the detailed examination of the position of the bones. Nevertheless, the way a corpse decays is not really understood by archaeologists (especially in soil) and so, its impact is underestimated. In order to overcome this problem, the author studied 50 corpses from recent burials (19th-20th centuries) as a part of his PhD research to understand how the decay process can influence the final spatial organization of bones. Thus, this paper deals with the decay process, the degradation of clothing and skeletal disarticulation process. The aim of this paper is to show how the variability of that biological phenomenon can significantly influence the archaeological image of the burial (putrefaction, mummification, saponification), but also the necessity to integrate that dimension of death in our reasoning to better reconstruct burial practices.

8 STUDYING REOPENED GRAVES WITH TAPHONOMY-BASED METHODOLOGIES: WHERE WILL WE GO NEXT?
Author(s): Aspöck, Edeltraud (Austrian Academy of Sciences) - Noterman, Astrid (Stockholm University, Department of Archaeology and Classical Studies)
Presentation Format: Oral

In this paper we want to review the state of the art of taphonomy-based studies of reopened graves. The aim is to identify areas for future developments to answer specific research questions as well as potential standardisations of methodologies. The focus of the paper will be on archaeoethanatology, but we will also consider results from micromorphology and digital archaeology. Subject of our contribution are inhumation graves, characterised by the interment of the complete body soon after death, usually in an organic container in a single grave cut in the ground. Many of these graves are found to have been reopened after deposition. Such evidence is typical for European cemeteries of the early Medieval period and can also frequently be seen in the central European early Bronze Age. The authors of this paper started their studies independent of each other and have recently summarised their results from applying archaeoethanatology to reopened graves. In this paper they will discuss potential further methodological developments using archaeoethanatology and other taphonomic methodologies to explore why a grave has been reopened in the past. To achieve this, answers to the following questions have to be found: When was the grave reopened? Which practices were carried out upon reopening? How have the human remains been treated? Have objects or human remains been moved, removed or deposited?

9 TALES FROM THE CIST (AND OTHER FEATURES): IRON AGE MORTUARY PRACTICES IN SOUTHWEST BRITAIN

Author(s): Bricking, Adelle - Madgwick, Richard - Sharples, Niall (Cardiff University)

Presentation Format: Oral

This research aims to shed light on the enigmatic Iron Age c. 800 BC-AD 43 mortuary practices in southwest Britain using a holistic approach of secondary data collection and primary macroscopic and microscopic analyses. The first part of the research explores the various means of corpse disposal by compiling all available human remains data into a database allowing statistical comparison of burial characteristics (site, feature, context, deposit, and associations). However, the dead were subject to various treatments prior to disposal, as indicated by different states of skeletal completeness in Iron Age sites. Data from secondary analysis alone limits insight into aspects of a complex funerary rite, thus the need for a holistic study incorporating microscopic examination is evident.

Thin section light microscopy of bone diagenesis has been proven to be a successful method to measure processes that a body went through in the early post-mortem period (such as burning, preservation and exposure to the elements) and in what kind of environment decomposition occurred. This research examines samples of Iron Age human remains in articulated, partially articulated, isolated, and fragmented states to compare the character of bacterial attack present on the different classes of bone. This method will identify patterns in pre-depositional treatment throughout southwest Britain. Together with the secondary analysis of human remains data, a more holistic reconstruction of Iron Age mortuary practices in this region will be achieved.

10 EXPOSURE IN THE EAST: A TAPHONOMIC ASSESSMENT OF EXCARNATION PRACTICES IN THE EASTERN ENGLISH IRON AGE

Author(s): Legge, Michael (Cardiff University; Exeter University)

Presentation Format: Oral

The Iron Age (c.800BC – AD43 in Britain) is a period of great variability with regard to burial rites. Cremations, cist burials, inhumations in cemeteries and domestic settings, disarticulation and deposition in wetlands appear to have been utilized simultaneously across Britain. Despite this, the majority of the Iron Age population is “missing” from the record. This research focuses on disarticulated human remains, which are found in myriad contexts across much of the country, and may provide the means to locate these individuals.

Taphonomic analysis of such material is helping to develop a new understanding of peri- and post-mortem processes, and has the potential to identify the funerary/mortuary practices that lead to disarticulation. Key among the debates within Iron Age funerary archaeology is that of excarnation. Since at least the 1970s, sub-aerial exposure (excarnation) has been suggested as the leading cause of the “missing dead” in the period, and the primary method of disarticulation. In the last 10-15 years however, taphonomic research has brought this into question. Work by Madgwick (2008, 2016) and others has shown that, for the west of England at least, there is little physical evidence for sub-aerial exposure practices.

Eastern England is, by comparison, relatively unstudied. Now, as part of an AHRC funded Ph.D. project investigating broader mortuary practices in the Iron Age, macroscopic taphonomic markers have been analyzed in c.350 disarticulated bones from 58 Iron Age assemblages in eastern England. The resulting data gives an excellent insight into funerary practices for the region and provides new evidence for the excarnation debate.

212 ROMAN ARCHAEOLOGY AND THE 21ST CENTURY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Lawrence, Andrew (Institut für Archäologische Wissenschaften, Universität Bern; CLUE+, Vrije Universiteit Amsterdam) - Murer, Cristina (Abteilung für Alte Geschichte und Rezeptionsgeschichte der Antike Historisches Institut, Universität Bern) - Krmnicek, Stefan (University of Tübingen)

Format: Regular session

Two decades into the 21st century, the political and social framework of Europe is facing multiple challenges with issues such as migration, growing political and social instabilities, and economic uncertainties on the table. Against the backdrop of these current transformations, Roman Archaeology could (rightly?) be considered an exclusive and elitist pastime by detached academics. Our session thus aims at discussing two major topics:

(1) Who cares about the Roman past anyway?

In the light of demographic changes in Europe, we must consider to which parts of society and to which audience Roman Archaeology is catering. Is the Roman past an identity marker only for a white, indigenous, European, Western civilization? What role can Roman Archaeology play in a society in quantitative and structural demographic transition? What strategies might Roman Archaeology develop to include all strata of the population?

(2) What is the take on Roman Archaeology at grassroot level?

Certain methodological, theoretical and intellectual issues of current international scholarship, such as the fragmentation of Archaeology into subdisciplines, growing language barriers, or questions on the costly application of natural sciences and new technologies are often only related to the realm of well-funded, higher-education research institutions. What are the key issues

that fall under the remit of local museums, archaeological parks, heritage agencies and the large number of non-academics engaging in Roman Archaeology?

Interested non-academics from the re-enactment scene, field archaeologists and find officers of regional heritage agencies, museum curators and managers, university faculty, and political stakeholders are invited to share their perspectives about the current state, potentials and limits of Roman Archaeology in the 21st century. The session aims at exploring Roman Archaeology's relevance today by giving a voice to all those involved in the discipline and by gathering professionals from all backgrounds contributing to the study of the Roman World.

ABSTRACTS

1 INTRODUCTORY KEYNOTE

Author(s): Lawrence, Andrew - Murer, Cristina (Universität Bern) - Krmnicek, Stefan (University of Tübingen)

Presentation Format: Oral

The modern world of archaeology is no longer confined solely to excavations, academic research or science communication in museum environments. It now embraces topics as diverse as citizen science, heritage protection or social media.

This paradigm shift is especially interesting for Roman archaeology, opening new opportunities on one hand, such as the public participation in heritage management or supra-regional collaborations, but on the other it advises us to look at our subject in a critical light, questioning the relevance of our research themes and choice of output.

Furthermore, European society and politics are constantly in flux. Yesterday's demographic is possibly no longer mirroring the interests of tomorrow's public. The aim of this introductory keynote is to set the scene for the following papers, offering facts and figures on Roman Archaeology in Europe. Drawing on results from the

recent European projects on interaction and participation with cultural heritage but also highlighting current research themes and discourses in our field.

2 REDISCOVERING THE ANTONINE WALL – MAKING OUR ROMAN HERITAGE MATTER

Author(s): Jones, Rebecca - Weeks, Patricia (HES Historic Environment Scotland) - McMullen, Emma (West Dunbartonshire Council)

Presentation Format: Oral

The Antonine Wall is Rome's North-western frontier and part of the Frontiers of the Roman Empire World Heritage Site. Yet it is not as well-known as it could be, in part due to its larger and better known southern neighbour, Hadrian's Wall. Since its inscription in 2008, six partners who manage the Wall have been working together on a range of projects to improve awareness and relevance of the monument to the local communities who live along its length. These communities were asked what they wanted to see in their area and, through an extensive consultation process, helped to co-design a series of local initiatives. These ranged from sensory gardens to 'Antonine Wall' arboretums; from graffiti projects for young people to intergenerational activities. The Wall runs through a wide variety of communities across a heavily populated area of central Scotland, including some areas of extreme deprivation and areas with a high number of asylum seekers. The results have fed into a £2.2 million project (which started in 2019) to deliver a range of community benefits, from Roman-themed playparks (co-designed with local school children) and replica distance stones through to volunteer training programmes and arts and museum outreach work. The diversity of regiments recorded along the wall will also feed into activities for refugee groups. The projects underway are ambitious, and seek to use our Roman heritage for transformational economic and societal benefit.

3 DIVERSITY AND THE PUBLIC TURN IN ROMAN ARCHAEOLOGY. PORTABLE ANTIQUITIES OF THE NETHERLANDS (PAN) AS A CASE STUDY

Author(s): Heeren, Stijn (Vrije Universiteit Amsterdam)

Presentation Format: Oral

Over the last decade, the demand for public outreach and societal impact of any academic discipline has become louder: be relevant, show what you are worth to the broader public, or you don't get funded. Citizen science is the new buzzword, although it remains a challenge to really include citizen scientists into research, and to realise truly in-depth research at the same time. Roman archaeology has a lot to offer to 21st-century society, because our Roman past can show how mobility and diversity went hand in hand with state structures in a globalised world 2000 years ago. We do however need smart ways to communicate this to the broader public and start building communities (partly) outside academia.

This contribution will raise the above issues, and provide a case study in which citizen involvement in science and meaningful academic research results are combined. The project Portable Antiquities of the Netherlands (PAN) studies archaeological finds discovered by private individuals, often using a metal detector, and publishes these online, with the help of the volunteers. Co-creation is now shaping a community of users/researchers. The PAN-database resulting from this project is a Fundgrube for interesting patterns in the material culture. Research based on the database is able to demonstrate for instance Germanic participation within the Roman province of Germania Inferior/Secunda. Connected with other classes of evidence, it can also be

used to highlight long-distance travel or migration. These results can be used to connect to contemporaneous issues in current society.

4 DO THEY KNOW IT'S ROMAN? COMMUNICATING SCHOLARLY RESULTS TO A WIDE AUDIENCE

Author(s): Kienzle, Peter (LVR-Archaeological Park at Xanten)

Presentation Format: Oral

In 1977 the Archaeological Park at Xanten (Lower Rhine Area, Germany) opened its gates to the public. Ever since, the archaeologists and architects in charge tried to present archaeological results to a large number of visitors from various backgrounds and various interests. The site of the former Colonia Ulpia Traiana has been saved from complete destruction by the development of an industrial estate and the exploitation for gravel. Today the archaeological park at Xanten is one of the most visited and best protected archaeological sites in Germany drawing more than 600.000 visits a year famous for its reconstructions and hands-on experience of "the Roman past".

On the one hand, museum exhibits of original remains, information panels, protection shelters and reconstructions try to communicate the results of scholarly research in a complete, though understandable way. On the other hand, large playgrounds (with Roman elements), living history and reenactment festivals draw large numbers of event-visitors. In the past, the park has been criticized, predominantly by academics, for being a "sort of Disneyland" or to be destructive to the original remains underground, but the park was also hailed by government executives for being a great example of presentation of the Roman past to an audience as wide as possible.

Based on the long experience on site, the contribution will explain the scholarly and scientific research at the site of the former Roman city, the decision making process in the background, the reconstruction work and the presentation of the site and a reflection on the visitor's perception of the Roman past.

5 'IT IS NOT THE JOB OF MUSEUMS TO ENGAGE IN LIBERAL SOCIAL ENGINEERING': ROMAN ARCHAEOLOGICAL DISPLAYS AND VISITOR EXPECTATIONS

Author(s): Goodwin, Karl (University of Kent)

Presentation Format: Oral

In the current political climate, local museums in Britain struggle for money and one way to make a case for their value is by emphasising their relevance to society. Museums have a primary role as educators that is recognised by many, however they can also be seen to have a social function. The question then revolves around how Roman archaeology may be deemed relatable and relevant for a modern audience.

Roman archaeology in museum exhibitions has an influential voice that engages people from many backgrounds. The diverse nature of the British demographic has meant that displays of Roman archaeology have had to move away from traditional, colonial depictions into a modern narrative. This paper discusses the data collected via a research questionnaire during the course of doctoral study, and asks what the public's expectations of a museum are, their personal experience of representation in museums, and how the Roman period is, and should be, shown.

This paper will use replies provided by participants to highlight how the museum-goer thinks Roman archaeology should be presented, and compare these with the challenges faced by local museums. There is a general expectation that museums have a duty to represent everyone in modern society, and should contribute to the challenging of social and institutional issues. However, many responses depict an opposing side to this opinion which complicates how a local museum can relate Roman archaeology to a modern audience. This paper discusses the conundrum faced by local museums in relation to how they frame Roman archaeology for a public with divergent opinions.

6 AIN SCHKOUR - A FORGOTTEN FORT ON A DISTANT FRONTIER

Author(s): Czapski, Maciej (Institute of Archaeology Warsaw University)

Presentation Format: Oral

Mauretania Tingitana was one of the African provinces of the Roman Empire. Situated on the North - West edge of the continent, naturally isolated from the other parts of the Roman world. Not much is known about the system of defence in this piece of Empire. When the Roman army appeared in the region at the 1st half of I AD the history of the living frontier had been started. Despite of some previous theories, no traces of the limes can be proven and all the pieces of the frontier defence are still a great mystery. The last research of the Polish - Moroccan team in Ain Schkour fort of the auxiliary unit can give an interesting insight in the relations between the Roman garrison and the local inhabitants of the province. Many inscriptions discovered in Volubilis gives us some idea about the ways of dealing with the local tribes and can confirm unusual character of the frontier zone in Tingitana.

HUMANS BEYOND ARROWHEADS. QUESTIONING THE INTERPRETATIVE VALUE OF ARROWHEADS AND OTHER TOOLS FOR RECONSTRUCTING PEOPLE IDENTITIES IN PREHISTORIC SOCIETIES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Visentin, Davide - Fontana, Federica (Dipartimento di Studi Umanistici, Università degli Studi di Ferrara) - Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266)

Format: Regular session

Since the 1970's archaeological and ethnographic studies (Gendel 1982, 1984, Hodder 1977, Wiessner 1983) have explored the potentiality of arrowheads as a meaningful parameter for measuring the ethnographic identities of prehistoric groups and the relationships among them. Later on, mainly in connection with the diffusion of technological studies, this assumption has been questioned on different grounds although remaining one of the fundamental notions for the identification and definition of past techno-complexes. This session aims at exploring and discussing the validity of this assumption by analyzing the archaeological and/or ethnographic evidence from different geographical and chronological contexts referable to hunter-gatherer as well as agro-pastoral societies. By doing so the session aims at fostering the debate on the theoretical and interpretative implications of the study of material culture. Such a debate is expected to do not only focus on arrowheads and lithic tools but also to include comparisons with other kinds of archaeological evidence such as ornaments, burial rituals, pottery and other technical traditions etc.

ABSTRACTS

1 PROJECTILE POINTS AS INDIVIDUAL SIGNATURES - RETHINKING THE PIONEER COLONISATION OF SOUTHERN SCANDINAVIA

Author(s): Pedersen, Jesper - Riede, Felix (Aarhus University)

Presentation Format: Oral

The earliest documented human occupation of southern Scandinavia is linked with the Upper Palaeolithic Hamburgian culture (~14,500-14,000 cal BP) which is traditionally divided into two phases: an earlier and more eastern 'classic', and a later north-western Havelte phase. Both phases are identified by their diagnostic projectile points: either the classic and asymmetrical shouldered points or the symmetrical Havelte tanged points. This chronological division has remained the norm since it was first proposed by Schwabedissen, who also argued the Havelte point to reflect a transitional element between the classic shouldered point and the subsequent tanged points in Bromme- and Ahrensburgian industries and thereby continuity between the various Late Glacial cultures of northern Europe, an interpretation still supported today. However, radiocarbon-data speak against this chronological division and indicates the two phases of the Hamburgian to be of a more synchronous nature. This is underlined by the fact that Classic and Havelte inventories do occur together. Furthermore, the two 'phases' only differ in the deliberate shaping of their diagnostic projectile points and not in any other aspect of their lithic repertoire. Focusing on the south Scandinavian inventories, these are few and seemingly of an ephemeral and short-term character. The projectile points within these inventories are all of the Havelte variant and almost identical across different sites. We cautiously interpret these as having been made by individuals who are socially and temporally closely related. Instead of a diagnostic for an entire chronological phase, the Havelte points may be understood quite differently, as an individual variant within the classic Hamburgian. This has major impacts for not only how we understand the Hamburgian, but also for how we understand Hunter-gatherer continuity and discontinuity in Late Glacial northern Europe. A novel approach to interpreting the classic and Havelte relationship is here presented with preliminary results.

2 FROM ARROWHEADS TO BEHAVIOURAL TRADITIONS: RE-ASSESSING THE LATEGLACIAL PALAEOHISTORY OF NORTHERN GERMANY

Author(s): Wild, Markus (ZBSA - Centre for Baltic and Scandinavian Archaeology; UMR 7041 ArScAn - Ethnologie préhistorique) - Weber, Mara-Julia (ZBSA - Centre for Baltic and Scandinavian Archaeology; UMR 7041 ArScAn - Ethnologie préhistorique; CRC 1266 Scales of Transformation, CAU Kiel) - Krüger, Sascha - Burau, Tobias - Eriksen, Berit - Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 Scales of Transformation, CAU Kiel)

Presentation Format: Oral

Based on the typological classification of lithic points combined with stratigraphic observations, the cultural development in the south-western Baltic region was considered as relatively clear by the mid-20th century with a succession of classic Hamburgian shouldered points, Havelte tanged points, curve-backed points / Federmesser, Brommian tanged points, and Ahrensburgian tanged points. However, studying the transitions and transformations of the Final Palaeolithic in this region, the question after the relation of the groups represented by these specific projectile implements arose again. The general similarity of the lithic assemblages suggested a close relation of the classic Hamburgian and the Havelte Group. The Federmesser-Gruppen (FMG) were considered as a very different tradition. For the Brommian a relation was suggested to the Ahrensburgian and/or the FMG, rarely also to the Havelte Group. These associations among the groups were interpreted as repeated expansions by different groups as well as adaptation to the changing environment or adoption of new ideas by a local population. These occasionally contradictory interpretations are possibly due to overlaps and gaps in the uneven distribution of (well-) dated assemblages.

In this paper, we assemble different lines of evidence for the early part of the human re-settlement (GI-1e-c) of this part of northern Europe, namely the phase from the classic Hamburgian to the Havelte Group and the FMG, to test the sustainability of the primarily typological distinction against technological developments, spatial behaviour, and the environmental conditions. Based on this, we identify differences and similarities between the relevant groups to point out continuities and breaks in the archaeological record. In comparison with the natural development, we consider in how far changes in the human-environmental interactions occur. This way we display the development of behavioural traditions and lines of transmission in their environmental context.

3 WESTERN DENE ARROW DESIGN AND FUNCTION, NORTHERN CANADA

Author(s): Thomas, Christian (Government of Yukon)

Presentation Format: Oral

Bow and arrow technology spread throughout the northwest of North America, replacing the throwing dart, over a period of 2000 years before the colonial period of North America. The mountainous regions of southern Yukon, Canada, is one of the last places this technology was adopted, and indigenous hunters maintained a bow hunting tradition until into the 1940s. In much of Yukon-Alaska the technology is characterized by complex composite bone or antler points that are highly stylized. Importantly, Dene arrows were designed for particular hunting situations, thus arrow styles were highly variable depending on the season of use or the animal being harvested. In this talk we will compare examples of archaeological arrow technology recovered from alpine ice patches at caribou and thinhorn sheep hunting territories to descriptions provided from hunters in a variety of Dene ethnographies with the objective of better understanding the interwoven complexities of function, identity and spiritual belief that can be observed in crafting styles.

4 TECHNOLOGICAL COMPLEXITIES OF THE PEOPLING OF EASTERN BERINGIA

Author(s): Wygal, Brian (Adelphi University)

Presentation Format: Oral

Alaska archaeologists continue to disagree on a unified culture history based on artifact typologies. The primary point of contention surrounds the presence or absence of microblade technology in central Alaska and the meaning of the Nenana and Denali complexes. While some interpret the former as a unique manifestation representing a separate migratory population, others disagree; and, the Denali complex has become a catchall category for a variety of artifact types leading to questions over its conceptual validity. This assessment tests specific questions pertinent to the relationship between prehistoric tool use and ecotones in an attempt to explain the presence or absence of particular artifact types and land use strategies through time. It also reflects on issues caused by repeated occupations, palimpsest assemblages, and other taphonomic processes that influence archaeological consensus. Results indicate separate phases in the initial colonization of Alaska and form a testable hypothesis based on functional land use properties associated with the Denali complex era in a way that distinguishes it from other early technologies in the region. The approach contributes to a longstanding discussion over subjectivity among archaeological categories and explains lithic assemblage variability in eastern Beringia with widespread implications for interpreting the initial peopling of the Americas.

5 PROJECTILE POINTS AS TOOLS FOR UNDERSTANDING A TERMINAL PLEISTOCENE-EARLY HOLOCENE COAST-HIGHLAND SETTLEMENT SYSTEM IN PERU

Author(s): Rademaker, Kurt - Panczak, Taylor (Michigan State University) - Osorio, Daniela (University College London) - Cook, Michael - Milton, Emily (Michigan State University)

Presentation Format: Oral

In southern Peru our group is investigating a Paleoindian settlement system with linked sites situated in diverse ecological zones and exhibiting different subsistence adaptations. This system encompasses one of the earliest coastal fishing sites in the Americas and high-elevation hunting sites on the Andean plateau. Determining the nature of this and other early inter-zonal connections is important for identifying routes used to settle Andean South America, with implications for colonization patterns at the continental scale. Traditionally, inter-zonal links have been detected by identifying exotic materials and determining their provenance, but this approach alone cannot distinguish single-group mobility from exchange between multiple groups. Early and sustained transfers of projectile points between highlands and coast may be the key to resolving the nature of the inter-zonal connection.

As artifacts that integrate socially learned stylistic information, projectile points provide a potential way to investigate the strength of shared material culture among sites. In our comparative analysis of early assemblages from this region, we combine insights from raw material provenance, morphological and stylistic attributes, and use-life histories of projectile points. Complementing this approach, we also examine burials and special personal objects that may help us to understand social identities and connections across this complex landscape.

- 6 CHALLENGING THE REALITY OF THE SAUVETERRIAN CULTURAL FACIES IN SOUTHERN FRANCE AND NORTHERN ITALY**
Author(s): Visentin, Davide - Fontana, Federica (Università degli Studi di Ferrara) - Philibert, Sylvie (UMR 5608 TRACES, CNRS) - Valdeyron, Nicolas (UMR 5608 TRACES, Université Toulouse Jean Jaurès)
Presentation Format: Oral
- The Early Mesolithic is one of the best known periods in European prehistory because of the very rich evidence yielded by archaeological researches during the last century. Nonetheless, most works carried out in this time span were focused on a regional or even site-oriented perspective. This can be partially connected to the general reduction of provisioning territories attested since the last part of the Pleistocene and the significant differences in material culture recorded by the archaeological evidence. Most likely, there is also a research-related reason for this, stemming out of the uneven interpretation of material culture as a distinctive marker of human groups variability. Western Europe is a clear example of this: while in the northern region researchers distinguished a high number of cultural entities on the base of differences in microliths shape and size, in the southern one a highest importance was given to common features leading to the creation of a large Sauveterrian territory. A recent revision of some of the most important sites from this latter area, gave us the opportunity to interrogate our evidence in this perspective in order to assess to what extent such situation could be related to a bias driven interpretation.
- 7 BEFORE THE ARROWHEAD. APPROACHING IDENTITY IN THE MESOLITHIC THROUGH PRESSURE BLADE PRODUCTION**
Author(s): Söderlind, Sandra (Institute of Pre- and Protohistoric Archaeology, Kiel University)
Presentation Format: Oral
- The discussion of identity in archaeology is strongly influenced by ideas and theory from disciplines such as sociology, social psychology, ethnography and ethnology - all of which are grounded in present time or the recent past. But can we as archaeologists, with the limited material remains from past societies, really come close to understanding such complex terms as identity and social groups dynamics in hunter-gatherer groups, existing thousands of years ago?
- In this talk, I will approach the topics of identity and transmission of knowledge through material culture related to a technological concept centred on blade production, using pressure technique, from single fronted cores. In north-western Europe these cores are known as handle cores. The small blades which are produced from these cores are often further worked, and used as inserts in slotted bone points and as arrowheads. Handle cores were produced and used in many parts of northern Europe and technological studies has shown variations in the production sequence in different regions. The investigation of these regional variations could aid in understanding social networks, transmission of knowledge, and perhaps identity, in the hunter-gatherer societies of northern Europe during the Mesolithic.
- 8 WHAT ABOUT THE DIVERSITY OF PROJECTILE POINTS AMONG THE LAST HUNTERS-GATHERERS IN CENTRAL RUSSIA? EXAMPLE OF ZAMOSTJE 2**
Author(s): Lozovskaya, Olga (Institute for the History of Material Culture RAS, St. Petersburg)
Presentation Format: Oral
- The period from the second half of 7th mil. to the end of 5th mil. cal BC on the territory of the Volga-Oka lowland (Central Russia) was distinguished by a large variety of arrowheads and spear points. Most of them were made from the bones (antler) of elk. The number of flint arrowheads is very small. Explanations of this phenomenon can be sought both in the specialization of weapons and in the heterogeneity of the population who left the objects of material culture. This period is associated with the spread of the first ceramics (without agriculture) and the formation of its production. Using the example of a multi-layered wetland site of Zamostje 2 with a rich series of projectile points (arrows, spears, leisters, harpoons etc.) made from organic materials, it is possible to try to correlate the main types of points with cultural, technological, economic and paleo-ecological events in the region.
- 9 ARROWHEADS AND OTHER MARKERS OF THE LATE NEOLITHIC COMMUNITIES FROM THE RITUAL FEATURES OF THE BELL BEAKERS IN NORTH-EASTERN POLAND**
Author(s): Klecha, Aleksandra (The Antiquity of Southeastern Europe Research Centre University of Warsaw) - Januszek, Katarzyna (Institute of Archaeology, University of Warsaw)
Presentation Format: Oral
- Over the past few years, four features related to the ritual funerary practices of the Bell Beakers have been discovered at the site Supraśl 3 in north-eastern Poland. In spite of repetitive and similar sets of artifacts forming the so-called Bell Beakers package, one of the them (no. 2) stood out from the rest by its content and composition of the deposited items. The objects contained a relatively large fragment of an ornamented ceramic vessel, on which some sort of a bag, probably made of organic material, had been placed. This "pouch" was filled with a loamy-sandy sediment, burnt fractions of bones, fragmented amber beads, pieces of a pottery from various ornamented Bell Beakers' vessels and flint artifacts, among which three arrowheads were distinguished. The whole set was covered with a bowl fragment and further artifacts were placed around the deposit.
- Since not all of the exotic items are perceived as typical of Bell Beakers communities in Central Europe, an individual approach to the particular analyses of each group of artifacts can lead to diverging conclusions. If the previous concepts would be used during the investigation, arrowheads could be treated as a cultural identifier. However, one of them, found together with the pottery

fragments, cannot be directly related to the Bell Beakers' flint manufacture.

Consequently, a multidimensional and coherent analysis of artifacts is the main option for not only determining the origin, but also the cultural and chronological attributes and probably more importantly, for identifying the creators of those deposits. The process of association of the items with their actual users belongs to the biggest difficulties of modern archaeology, this is why conclusions based only on one type of the artifacts usually cannot be taken under general consideration.

A. **CHIPPED STONES AS IDENTITY MARKERS FROM LATE NEOLITHIC GRAVES AT POLGÁR-CSŐSZHALOM, HUNGARY**

Author(s): Farago, Norbert - Anders, Alexandra - Csippán, Péter - Raczky, Pál (Eötvös Loránd University, Institute of Archaeological Sciences)

Presentation Format: Poster

The Late Neolithic site of Polgár-Csőszhalom is one of the most significant site complexes of the Hungarian prehistory. The northernmost tell in the Carpathian Basin would be important in itself, but the encircling and intensively excavated horizontal settlement makes this settlement even more interesting.

Among the many complex phenomena from this site, the 123 graves provided further information about arrowheads and human identities. The analysis of the chipped stones coming from twenty burials has already suggested preferences in grave good choices in accordance with sex and age. Broken blade fragments, truncated blades, and trapezes were associated exclusively with males deceased mostly between the age of 20 and 40. On one side bioarchaeological analysis provided further information about the active and challenging life history of these chosen persons, on another side evaluation of the archaeozoological remains from the settlement provided clues about the possible utilization of these specific pieces. Considering the chipped stone assemblages coming from ordinary settlement features, it seems that among the 12 thousand pieces found at the horizontal settlement trapezes are almost completely absent. Moving one step back and placing the results into a wider temporal and spatial context, chipped stones in similar situations from various other sites could have additional information or could gain a new perspective.

The complex approach presented here is unique in its kind with respect to the evaluation of chipped stones as grave goods from the Neolithic of the Great Hungarian Plain.

The project is funded by a grant from the National Research, Development and Innovation Office (Grant no. K124326: Neolithic life histories. Bioarchaeological investigations on burials of the Polgár micro region).

B. **THE ARCHER BURIED UNDER THE BARROW 10 FROM VALEA STÂNII (ROMANIA). ISSUES OF ITS ORIGINS, PECULIARITIES AND DATING**

Author(s): Mandescu, Dragos (Arges County Museum)

Presentation Format: Poster

The topic deals with a unique find from the Early Iron Age incineration necropolis from Valea Stâniei, Țițești commune, Argeș County (mid-Romania, South of Carpathians). In the single grave under barrow 10 (explored in 2016) appeared for the first time attested in the Ferigile group the bronze arrowheads belonging to some different variants, leaf-shaped, trefoil and triangular cross-section blade. Not less than 30 such arrowheads, some of them barbed (14 exemplars, trefoil and leaf-shaped), were deposited together with a "soldered" bulk composed by another around 10 thin, flat, and triangular iron copies belonging to the well-known Ferigile type arrowhead, along with ash, charcoal and few calcined bones. Thus, the contemporaneity between the two great types of arrows (bronze "Scythian" and iron Ferigile one) is demonstrated, as well as the fact that the Ferigile communities were not so conservative about this type of weapon, anyway, at least not in the manner and extent that were suspected so far. The arrowheads from Valea Stâniei are typologically determined by reference to the analogies provided by different spaces and cultural groups (the tombs of early Scythian culture North of the Black Sea and from forest-steppe zone, West Podolian cultural group, Ciurbrud group in Transylvania, East-Hallstattian cultural zone etc.). The dating of this batch of arrowheads in the second half of the 7th century BC (most likely only in the third quarter of the 7th century BC, ±650-625) rises some chronological issues that may have significant implications for the general dating of the Ferigile cultural group.

216 **NEO-JADE: NEW PATTERNS IN STONE AGE EXOTIC STONE EXPLOITATION AROUND THE WORLD**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Bausch, Ilona (Kokugakuin University Museum; Sainsbury Institute for the Study of Japanese Arts & Cultures) - Sørensen, Lasse (National Museum of Denmark)

Format: Regular session

Worldwide, jade and jade-like minerals (including but not limited to jadeitite and nephrite) were selected for the production of ground stone tools or ornaments. Such objects were particularly valued as a mediator of entanglement: a symbolic communicator connecting people in past, present and future. Their scarcity and physical, functional and aesthetic qualities have inspired peoples to travel long distances to acquire these raw materials. This session is a search for new patterns in the exploitations of jade (and minerals with similar properties) around the world, and focuses on quarrying, exploitation, distribution, production, use, and socio-political and cultural significance in Stone Age communities.

After the pioneering exploitation stage, how does jade become integrated in prehistoric societies as a routinized practice? Does it entail the creation of special meeting places, hubs of activity, specific kinds of rituals involving specialised knowledge? Does it entail social change? Was there a preference for "jade" above minerals with similar properties? These discussions are dependent on provenance and social and archaeological context. Approaches include petrographic and geochemical analysis; and the chaîne opératoire of jade (aspects involving production, circulation, consumption, and discovery).

Although the main focus is on Europe, we also encourage comparative perspectives, from regions including Eurasia, East and Southeast Asia, the Pacific and the Caribbean. This will give rise to a new proxy for the study of the emergence of prehistoric societies, and development of social and organizational complexity.

ABSTRACTS

1 CHINESE AND EUROPEAN JADE: TWO WAYS OF DEVELOPMENT

Author(s): Eusgeld, Irene - Song, Baoquan (University of Bochum) - Bausch, Ilona (Kokugakuin University Museum)

Presentation Format: Oral

Jade was highly valued in different cultures of the world in prehistoric times. Several thousand jade axes have been found in Europe. They served as prestige objects a cultic or ceremonial purpose rather than a practical one. Copper or bronze axes replaced the jade ones in the Chalcolithic, and subsequently jadeite axes found no use in Europe anymore. They fell into oblivion.

In Neolithic China, on the other hand, jade was also processed into axes, ritual tools and jewelry. However, a jade cult arose that was handed down from generation to generation. This jade cult developed into the Chinese jade culture, which looks back on a continuous, more than 7000-years history and has remained an integral part of the value system in China to this day.

How can these differences between the European and the Chinese way be explained? The answer could probably be found in the origin of the Chinese jade culture. The discovery of Neolithic jade cultures in China (particularly Hongshan and Liangzhu cultures) has weakened the long-established hypothesis that Chinese civilization had developed exclusively in the Yellow River basin. The importance of jade objects within many different ethnic groups in areas far away from the future center of Chinese civilization has been recognized. Various Neolithic jade objects found in burials of these 'marginal areas' indicate already mature and complex faith/religion systems and associated funeral rites (e.g. Lingjiatan and Xinglongwa cultures).

The differences in funeral inventory point to a stratified society that seems to possess considerable human and natural resources as well as a well-functioning organization system. Apparently, a division of labor and specialization took place already during the Neolithic period. In this regard, the question arises as to how jade processing and usage played a role in the emergence and stabilization of Chinese civilization.

2 THE USE OF JADE IN THE CARIBBEAN

Author(s): Knippenberg, Sebastiaan (Archol BV, Leiden, Netherlands; Faculty of Archaeology, Leiden University) - Rodríguez Ramos, Reniel (University of Puerto Rico, Utuado) - Schertl, Hans-Peter - Maresch, Walter (Institute of Geology, Mineralogy and Geophysics, Ruhr-University Bochum) - Hertwig, Andreas (UCLA, Los Angeles) - García-Casco, Antonio (Department of Mineralogy and Petrology, University of Granada; Andalusian Institute of Earth Sciences, CSIC-University of Granada; Department of Earth and Planetary Sciences, American Museum of Natural History, New York) - Harlow, George (Department of Earth and Planetary Sciences, American Museum of Natural History, New York) - López, Adolfo (Santo Domingo) - Hofman, Corinne (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

The importance of jade in the Caribbean has long been acknowledged due the usage of the nephrite variety of jade for the manufacture of zoomorphic pendants. Since the early 2000's in-depth petrographical, mineralogical and geo-chemical work on a number of axes has shown that the jadeite variety of jade had also been used and much valued within this island archipelago. Although we are still largely unaware of the exact provenance of nephrite in the region, the sourcing of jadeite rock has seen considerable progress during the past 15 years. Three source regions are of significance: the Rio San Juan region in northern Dominican Republic, the Sierra del Convento in eastern Cuba, and the Motagua Fault Zone in Guatemala. Recent techno-typological study and in-depth analyses of artefacts, have demonstrated the complex nature of jadeite characterization and the difficulties with discriminating the three main localities.

Despite these difficulties in firmly pinpointing a source, the archaeological record of jadeite use after AD 600 has provided some patterns that favour the exploitation of the local Caribbean sources over the Guatemala one, although the latter cannot totally be ignored. The available data suggest that manufacture, distribution, and exchange of jadeite tools occurred between ca. AD 600 and 1500, and strongly coincides with Ceramic Age habitation on the Greater Antilles. Jadeite axes became distributed over considerable distances spanning the entire insular Caribbean. Its spread was facilitated by the already existing inter-island exchange networks tying the communities on the islands. Archaeological finds show that jadeite was not only valued as an excellent tool material, but that it also fulfilled a role in a ritual realm. We therefore argue that the control over this jadeite might have played an important role in the socio-political competition between the different Greater Antilles chiefdoms that arose during the Late Ceramic Age.

- 3** **GEOCHEMICAL CHARACTERISATION OF JADEITITE IN THE GREATER CARIBBEAN AND SOURCE DISCRIMINATION APPLYING MULTICLASS-REGRESSION ANALYSES: IMPLICATIONS FOR PRECOLONIAL INTER-ISLANDS EXCHANGE NETWORKS**
- Author(s):** Knaf, Alice (Geology and Geochemistry Research Cluster, Free University Amsterdam) - Habiba, Habiba (CSIRO's Data61) - Koornneef, Janne (Geology and Geochemistry Research Cluster, Free University Amsterdam) - Harlow, George (Department of Earth and Planetary Sciences, American Museum of Natural History, New York) - García Casco, Antonio (Department of Mineralogy and Petrology, University of Granada) - Hertwig, Andreas (Earth, Planetary and Space Sciences, UCLA) - Schertl, Hans-Peter (Institute of Geology, Mineralogy and Geophysics, Ruhr-University Bochum) - Hofman, Corinne (Faculty of Archaeology, Leiden University) - Brandes, Ulrik (Chair of Social Networks, ETH Zurich) - Davies, Gareth (Geology and Geochemistry Research Cluster, Free University Amsterdam)
- Presentation Format:** Oral
- Knaf, A.C.S., Habiba, H., Koornneef, J.M., Hertwig, A., Cárdenas Párraga, J., Harlow, G.E., García Casco, A., Schertl, H.-P., Maresch, W.V., Hofman, C.L., Brandes, U. and Davies, G.R.
- Jadeitite was highly valued and used by pre-colonial Amerindian societies throughout the Greater Caribbean to produce daily and ceremonial objects. Regionally, jadeitite sources are only known in Guatemala, north and south of the Motagua Fault Zone (GM, NMFZ and SMFZ), eastern Cuba (CU) and the northern Dominican Republic (DR). Finds of exotic/non-local jadeitite artefacts establishes exchange and transport over vast distances and provides fundamental information about former trading and mobility networks between different Caribbean islands and the mainland. Despite general geological similarities among the jadeitite source rocks, different ages, protoliths, P-T conditions of jadeite formation and (re-)mobilization of different fluid compositions offer the potential to geochemically discriminate the sources.
- This paper provides a novel geochemical database of currently known Caribbean jadeitite and jadeite-omphacite-rich source rocks to determine local and regional variation. The geochemical data are subjected to a multiclass-regression analysis to establish quantitatively how effectively the provenance of archaeological Caribbean lithic artefacts can be determined. The first approach was to assess 3 jadeitite source regions (DR, CU, GM) based on trace element ratios and subsequently see if it was possible to resolve 4 (DR, CU, GM NMFZ, GM SMFZ). Here we present the results of the discrimination model. The successful analyses can be applied to artefacts of jadeitite composition of unknown provenance in the Greater Caribbean.
- 4** **COMBINED USE-WEAR AND PROVENANCE ANALYSES OF PRE-COLUMBIAN JADEITITE ARTEFACTS FROM THE CARIBBEAN ISLANDS HELD AT THE NATIONAL MUSEUM OF DENMARK**
- Author(s):** Toftgaard, Casper (National Museum of Denmark; University of Copenhagen) - Knaf, Alice - Davies, Gareth (Vrije Universiteit Amsterdam) - Falci, Catarina - Hofman, Corinne (Leiden University)
- Presentation Format:** Oral
- The presence of artefacts made of jadeitite in pre-Columbian assemblages in the Caribbean has long been suspected by archaeologists. Their hypothesis was proven in 2006, when archaeologists and geologists combined and analyzed pre-Columbian lithic celts excavated on Antigua. All the Antiguan jadeitite celts were assigned, as no other sources were known, to jadeitite cropping out in the Motagua Valley, located in Guatemala some 3000 km away. In the last decade two more jadeitite sources were identified on eastern Cuba and the northern Dominican Republic questioning Guatemala as only source for jadeitite objects found on the Lesser Antilles Islands.
- These findings had significant implication for the National Museum of Denmark, as it curates one of the largest pre-Columbian collections from the Caribbean Islands outside of the Americas, including more than 1900 celts, a large percentage of which appear to be made of a jadeitite. Furthermore, the collection covers all the Caribbean Islands from Trinidad in the Southeast to Cuba in the West. However, only a smaller cross-disciplinary study in connection with the JADE II project had been attempted on the suspected jadeitite artefacts in the collection until a collaboration with the large-scale international ERC-Synergy NEXUS 1492 Project started in January 2017.
- Here we present novel data on the use-trace of jadeitite bodily ornaments and geochemical data of jadeitite celts retrieved from the Caribbean Islands contributing to a holistic view on lithic artefacts including raw material collection, production, use and distribution of the objects. This study demonstrates that the Pan-Caribbean exchange of jadeitite raw materials, pre-forms or finished quotidian and ceremonial objects during the ceramic periods (500 BC to 1550 AD), occurred on a more complex scale than previously thought including jadeitite sources in Guatemala, eastern Cuba and the northern Dominican Republic.
- 5** **A PROVENANCE STUDY OF LUCAYAN PRE-COLONIAL JADEITITE CELTS: UNRAVELING MOBILITY NETWORKS IN THE GREATER CARIBBEAN**
- Author(s):** Knaf, Alice (Geology and Geochemistry Research Cluster, Free University Amsterdam) - Ostapkowicz, Joanna (School of Archaeology, University of Oxford) - Davies, Gareth (Geology and Geochemistry Research Cluster, Free University Amsterdam)
- Presentation Format:** Oral
- Project SIBA (Stone Interchanges in the Bahamas Archipelago) brings together the largest corpus of Bahamian/TCI lithic artefacts ever assembled - over 300 jadeitite artefacts from eight international museums, including the Smithsonian's National

Museum of the American Indian, the Smithsonian's National Museum of Natural History, the American Museum of Natural History and the Peabody Museums at Yale and Harvard. In an entirely limestone environment like the Bahamas/TCI, all hard rocks had to be imported: our objective is to determine the source of these exotics. The selected artefacts have well-documented collection histories, forming an exceptionally rich corpus for investigating materials and meanings. This information together with the provenance allow us to explore the extensive social, political and economic connections between the archipelago and its wider Caribbean setting. A "non-invasive" laser ablation sampling system enables us to sample museum artefacts on location in a macroscopically non-invasive mode leaving ablation pits the diameter of a hair, essentially invisible to the human eye. Subsequent geochemical analyses of the artefacts by ultra-low blank trace element and Sr-Nd isotope analyses is performed on microgram amounts of material. The three jadeitite sources in the region (Cuba, Guatemala and Dominican Republic) have been characterized and a discrimination model established as part of the ERC-Synergy NEXUS 1492 Project. These data provide the required background information to determine the provenance of jadeitite artefacts across the Bahamas and hence better understand trading networks in the region.

6 EXPLOITATION, DISTRIBUTION AND USE OF ST. MARTIN GREENSTONE. THE CASE OF THE CHEMIN DE M. DE L'ORME SITE, LA DÉsirADE

Author(s): de Waal, Maaïke (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

For several reasons, St. Martin greenstone is a remarkable stone material that can be found in archaeological contexts in the Caribbean. First, St. Martin greenstone is a confusing name of archaeologists. The rock, when found in archaeological context, does not have a green appearance at all. The rock has a clear green colour when freshly exploited, but it gradually turns into a grayish, whitish chalky material with corroded and crumbly surfaces as result of chemical weathering. Second, this material is known to have a very limited natural occurrence. It can only be exploited at St. Martin. However, this did not prevent the material to be distributed all over the Caribbean. In addition, outside St. Martin, this greenstone is only found in the form of finished ground tools. This indicates that the objects were manufactured in St. Martin, and distributed as finished products.

One of the sites in which St. Martin greenstone objects were found is the Chemin de M. de l'Orme site at the Eastern Caribbean island of La Désirade. This paper will discuss the special context of this site, one of the few ceremonial pre-colonial sites at this island, and the possibly political and cultural significance of this find.

7 BIOGRAPHIES OF JADE: FUNCTIONAL AND TECHNOLOGICAL INSIGHTS INTO THE CIRCULATION OF GREENSTONE AXES IN THE PRE-COLONIAL CARIBBEAN

Author(s): Breukel, Tom - Hofman, Corinne - Van Gijn, Annelou (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

The discovery of both jadeitite artefacts and sources in the Caribbean has produced novel insights into the regional circulation of greenstone celts during the Ceramic Age. Long-distance exchange ties have been demonstrated, and studies highlight that stone celt production was often monopolised by certain communities. Nevertheless, much remains unclear about the importance attributed to particular raw materials, the technologies used to manufacture celts, the social effects that drove their circulation and were produced by it, and so on. Here, we discuss the biographical analysis of four celt assemblages containing diverse raw materials from Grenada and the Dominican Republic. This involved an experiment-based study of microscopic traces of wear relating to the operational sequence and function of the artefacts. We demonstrate that jadeitite celt biographies are not significantly different from those made of other raw materials, that morphologies change over time as a result of use, and that movements across spatial contexts are social and technological necessities during the life cycle of celts.

8 JADE CIRCULATION AND USE AMONG PREHISTORIC HUNTER-GATHERERS: THE MIDDLE JOMON CULTURE IN JAPAN

Author(s): Bausch, Ilona (Kokugakuin University Museum; Sainsbury Institute for the Study of Japanese Arts & Cultures)

Presentation Format: Oral

Jade was discovered in the Japanese archipelago from c. 6000BP, and it continued to be exploited by the Jomon hunter-gatherer communities until the end of the period, c. 2400BP. It is clear that jadeitite, generally processed in the form of ground and pierced "ornaments", played an important social role. While nephrite and other jade-like stones from different sources also were occasionally employed, jadeitite from the Itoigawa source was most highly valued, circulating across the Japanese archipelago (albeit never reaching the continent). During the later Jomon, these took the form of fairly uniform small round or curved beads, frequently found accumulated inside a few burials. However, the jade objects classified as "large pendants" from the earlier phase (c. 6000~3500 BP) are far more diverse in size, shape, quality of the material and degree of finish. Moreover, there is also variation in deposition: mortuary contexts, ritual deposition, house floors or scattered over the settlement. So far, much about their use is unclear: how long these objects were in circulation before reaching the end of their use life; whether they were passed along by multiple generations or not. Furthermore, it is necessary to reassess whether these objects were exclusively worn as bodily adornment, as is usually assumed. To some extent, appearance and treatment may reflect regional cultural preferences, and the long-distance trade networks and transmission of customs. This presentation focuses on several case studies from North and Central Japan, taking into account depositional contexts as well as use wear, to evaluate diversity in the use and social

value of jadeitite objects in Middle Jomon Japan.

- 9 PREHISTORIC MARBLE QUARRIES AT THE BÍLÝ KÁMEN NEAR SÁZAVA (BOHEMIA, CZECH REPUBLIC)**
Author(s): Burgert, Pavel (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Prichystal, Antonin (Department of Geological Sciences, Faculty of Science, Masaryk University, Brno)
Presentation Format: Oral
- A study of mining and distribution of silicite raw materials has traditionally received much attention from European research. On the other hand, non-siliceous rocks has largely been excluded from research interest. The main reason has been difficult methodology of accurate petrographic study of these materials. Yet the potential of these raw materials is great, and the results obtained by their studies can have a major impact on the assessment of intercultural interactions of prehistoric populations.
- Marble, as a raw material of prehistoric jewellery, appears in greater extent in the Central European Neolithic. Its findings belong to LBK but especially to younger cultures in the western part of Central Europe. These are the Stroked Pottery culture and Rössen culture. Only little attention has been paid to the provenance of the marble. An important role is played by evidence of its prehistoric mining in the Sázava region (Central Bohemia; Czech Republic). The quarries were discovered in the period between the world wars, thereby they most likely represent the longest known prehistoric mining of non-silicite raw material throughout Europe. At the time of its discovery, the finding was published only locally, and the further development of the subject was overshadowed by post-war development. The paper presents the results of a new research, focusing on a key locality with mining evidence. It also summarizes the results of geochemical analysis which proves that the marble used in prehistory had its origin in different localities in the Central European area.
- 10 NOT ONLY JADE: LONG-SCALE CONNECTIONS REVEALED BY THE NEOLITHIC POLISHED STONE AXES OF CAPUT ADRIAE**
Author(s): Bausch, Ilona (Kokugakuin University Museum; Sainsbury Institute for the Study of Japanese Arts & Cultures) - Montagnari Kokelj, Manuela (Department of Humanistic Studies, University of Trieste) - Bernardini, Federico (Centro Fermi, Museo Storico della Fisica e Centro di Studi e Ricerche; Multidisciplinary Laboratory, The "Abdus Salam" International Centre for Theoretical Physics)
Presentation Format: Oral
- The results of a long-term project on the stone axes from Caput Adriae show that jade axes originating in the western Alps reached the Neolithic groups of Friuli Venezia Giulia and coastal Istria as early as the second half of the 6th millennium BC, during the Danilo/Vlaška culture. The exchange of this and other classes of lithic artefacts testifies that in this period this area was fully integrated into long-distance exchange systems that used mainly coastal routes. These systems would have continued in the 5th millennium BC, as indicated by a few oversized jade axe blades and other materials. Far from the coast, jade axes entered central Slovenia, probably reaching sites of the Sava Group of the Lengyel culture in the first half of the 5th millennium BC. In roughly the same period, shaft-hole axes made of Bohemian metabasites spread over central and south eastern Europe, crossed the Alps and reached Italy. According to different Neolithic traditions, during the 5th millennium BC Europe appears to be divided into a jade-using western area and a central-eastern BM-using one.
- 11 JADEITITE AND OTHER AXES IN THE EASTERN MEDITERRANEAN DURING THE NEOLITHIC AND BRONZE AGE**
Author(s): Sorensen, Lasse (National Museum of Denmark)
Presentation Format: Oral
- The largest known jadeitite source in the Aegean is located on the Cycladic island of Syros. During sampling, several patinated flakes and preforms of considerable age were identified, demonstrating, for the first time, the presence of several knapping places around the large jadeite boulders. In order to classify the specific trace elements from the source of Syros a series of investigations has been initiated using radiospectrometry, XRD, and ICP-analysis.
- In connection with the study of jadeitite axe assemblages in the Aegean and Anatolia, several Neolithic and early Bronze Age sites contain these rare objects together with other axes made of nephrite, and hematite, thus allowing a comparison between geological sources and archaeological artefacts. The results indicated that the axes originated from jadeite sources in the Italian Alps, the local source on Syros and unknown sources. The nephrite and hematite sources are still unknown, but comparisons between the polished axes indicates the presence of previously unknown exchange networks within the neolithic and bronze age societies in the Eastern Mediterranean region.

'UBIQUITOUS MONUMENTS, UBIQUITOUS PLACES'. CURRENT RESEARCH IN BARROW LANDSCAPES FROM PREHISTORIC TO MODERN TIMES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT; Leiden University, Faculty of Archaeology) - Rodríguez-Del Cueto, Fernando (University of Oviedo) - Szubski, Michał (Cardinal Stefan Wyszyński University, Institute of Archaeology)

Format: Regular session

This session aims the historical and archaeological analysis of one of the most common archaeological remains in Europe, such as the barrow monuments are.

The presence of similarity in monumental architecture and interchange of material culture in long-distanced territories of modern days Europe was used to indicate a common world of shared beliefs, not only as a remarkable thread of cultural similarity across Europe but also as a result of a high probable degree of connectivity between these territories during prehistoric times and afterwards.

All of this has led as well to common archaeological problems in the research of barrow landscapes, and the aim of this session is to share both historical and methodological problems, no matter the chronology of the monuments. The proposed session will bring together specialists from different periods and regions with the aim of discussing, through a variety of case studies and methodological approaches, the analysis of such mounds.

The session will be structured in the following topics:

- Data acquisition and dissemination. From archaeological survey to excavation: remote prospection, teledetection (LiDAR, aerial photography, drones), and new ways to get archaeological data - 3D modelling, automatic and semi-automatic archaeological detection. Also problems in heritage management and difficulties to preserve a high number of newly detected structures.
- Identification: similarity in barrow morphology and modern mounds (such as kilns, boundary features) - how to distinguish them and investigate.
- Time: Problems in dating cluster of barrows and possible solutions without excavations - e.g. Bayesian approaches.
- Monument: Specific case studies which show the results of excavations and reutilisation processes in modern times.
- Monumental landscapes: Case studies at landscape scale, with integration of GIS and statistical approaches to model locational preferences and human behaviour, computationally-informed landscape archaeology.

ABSTRACTS

1 BRONZE AGE MONUMENTS IN THE WITHAM VALLEY, LINCOLNSHIRE: THE INVESTIGATION OF EIGHT ROUND BARROWS AND THEIR LANDSCAPE SETTING

Author(s): Chowne, Peter (University of York)

Presentation Format: Oral

This paper builds on research initially reported at the 15th Annual Meeting of the EAA and subsequently published in 2015. A number of barrow complexes on the Lincolnshire Fen Margin and in the valley of the River Witham were described with LiDAR enhancing our understanding of the partially buried landscapes in which the monuments were constructed.

In 2016-18 an opportunity to arose for the excavation and recording of the Canwick/Washington group of four round barrows south of the River Witham and the Greetwell group of four north of the river in advance of road construction. The development enabled the near total excavation of a 300 metre wide transect through the peat-filled river valley.

The paper will describe the development of the monument complex, funerary practices and the condition of the archaeological monuments and palaeoenvironmental remains and the significant implications for the management and preservation of the barrows outside the road corridor and complexes elsewhere in the Witham Valley. Although post-excavation analysis has only just commenced it is clear that when complete, the results of these investigations will transform our understanding of barrow landscapes in the region.

Chowne, P. 2015. Bronze Age Barrow Complexes on the Lincolnshire Fen Margin. In: Vianello, A. (ed) Rivers in Prehistory. Archaeopress, Oxford, 125-136.

2 THE SPATIAL STRUCTURE OF GALICIAN MEGALITHIC LANDSCAPES (NW IBERIA): A CASE STUDY FROM THE MONTE PENIDE REGION

Author(s): Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT; University of Leiden, Faculty of Archaeology) - Bevan, Andrew - Lake, Mark (UCL Institute of Archaeology)

Presentation Format: Oral

It is well known that Neolithic megalithic landscapes are the result of complex locational logics governing where communities chose to site their funerary monuments. These logics in turn respond to broader environmental and cultural affordances, and the relationship between these has been a major topic in the megalithic archaeological literature for the last few decades. Thanks

to both new approaches in spatial statistical modelling, and a further novel method for testing site hierarchy that is introduced in this presentation, there is now considerable opportunity to revisit traditional megalithic locational concepts from a more systematic point of view, not least in Galician studies (NW Iberian Peninsula) but also in other territories. In the research that follows, we apply such a modelling approach to a large set of megalithic monuments located in the south of Galicia (Monte Penide and surroundings) with a view to exploring locational choices, spatial hierarchy and territoriality in these funerary landscapes.

3 PATTERNS OF MOUNDSCAPE BETWEEN DNIESTER, PRUT AND DANUBE RIVERS

Author(s): Topal, Denis (University of High Anthropological School; National Agency for Archaeology)

Presentation Format: Oral

The erecting of barrows over the dead appeared in the Pontic area of Eastern Europe in late Eneolithic, 3900—3800 BC. Since that time barrow rite became an important part of the funeral praxis of the various cultures of Bronze, Iron ages, Roman, Medieval and Modern periods till the turn of 18-19th centuries. The preliminary statistics of excavated barrows demonstrates the existence of two main periods in the tumuli erecting: Early Bronze Age (Usatovo, Yamnaya cultures, 3500—2000 BC) and Late Bronze Age — Iron Age — Roman period (Belozerka, Scythian, Sarmatian cultures, 1200 BC — 400 AD). There are excavated and published more than 700 barrows (>5.000 burials) between Dniester and Prut rivers. The first barrows in the region of interest were excavated in the late 19th century, but the peak of barrow research is documented for 1970-1980s. Analysis of satellite images and topographical maps composed before the wide-spread excavations showed the main concentrations of barrows (sampling is over 10.000) and the linear patterns of their distribution connected to the natural features of relief. Barrow lines are predominantly placed on the ridges and oriented parallel to the rivers. The preliminary analysis of excavated barrow lines demonstrates the fact of the initial planning of the burial grounds by the early cultures and subsequent use due to the linear pattern, probably connected to the roads, trackways or migration routes.

4 NEW FINDINGS FROM THE EXCAVATION AND SURVEY AROUND THE OLDEST ROYAL “SCYTHIAN” BURIAL MOUND

Author(s): Caspari, Gino (University of Sydney; University of Bern)

Presentation Format: Oral

The Early Iron Age in the Eurasian steppes marks the beginning of the appearance of fully mobile pastoralist groups and a steeply hierarchical society with a social elite of warriors fighting from horseback. A largely coherent material culture spread from Mongolia to Eastern Europe constructing large “royal” burial mounds for the elite. The origins of this material culture are not well understood due to a lack of archaeological data and landscape archaeological contextualization. In this talk we will present new results of the investigations at Tunnug 1 in Tuva Republic. Being located in a swamp, constructive wood from the burial architecture is excellently preserved (Dated through wiggle-matching between 833 and 800 BC (95.4%)), however, its strange position in the landscape make both surveys and excavation a difficult endeavour. The 2018 campaign has begun to reveal the complex internal architecture of the monument and further research in 2019 will uncover large parts of the burial mound.

5 SEARCHING FOR MEGALITHIC QUARRIES. SOME INITIAL EXPLORATIONS IN THE BARROWS OF SALAS COUNCIL (ASTURIAS, SPAIN)

Author(s): Rodríguez del Cueto, Fernando (Universidad de Oviedo, Facultad de Filosofía y Letras, Departamento de Historia) - Pazos, Miguel (University of Santiago de Compostela-GEPN-AAT/University of Leiden, Faculty of Archaeology)

Presentation Format: Oral

This paper explores a specific landscape in the central and southwestern part of Salas council (NW Iberian Peninsula), which contains five prehistoric cemeteries chronologically framed between the Neolithic and the Bronze Age periods: San Juan, Corradas, Idarga and Penausen-Calabazos.

The most remarkable site is the dolmen of Cobertoria, where the ongoing excavations are providing detailed information about the sequence of burial practices: a chamber with monumental orthostats dated in the 3500 BC. However, previous phases have been identified in the tomb: first, a stone burial mound was built around the 4000 BC and second, a ring of red clay was constructed nearly 3700 BC. The results of a cross-tab analysis of the composition of the clay used in this prehistoric structure and clay samples from the surroundings allow us to establish considerations about the time consumed from the original quarry to the site.

The main goal of this presentation is to show how we can extend similar links between the quarries and the group of megalithic chambers by using airborne LiDAR techniques to identify possible outcrops. Overall, these prehistoric spaces will be analysed from a geological point of view, using LiDAR to identify the original position of the raw materials. Although three of the cemeteries have no scientific excavations, field survey works have allowed us to establish preliminary hypothesis about the internal composition of the tumulus, as it occurs in Idarga’s cemetery, where the enormous quantities of stones present in the surface of the hill show the presence of building materials in the nearby funerary space.

Finally, the distances gathered at the end of the analysis will allow us to carry out a most detailed approach to the indigenous communities, the type of the materials used in each case as well as the connections between the quarries and the tombs.

- 6** **IN SEARCH OF INVISIBLE BURIAL MOUNDS ON THE LANDS OF NORTH-EASTERN RUS'**
Author(s): Krasnikova, Anna (State Historical Museum) - Erokhin, Sergey (Institute of Archaeology, Russian Academy of Sciences) - Medvedev, Andrey (Institute of Geography, Russian Academy of Sciences) - Makarov, Nikolay (Institute of Archaeology, Russian Academy of Sciences) - Modin, Igor (Moscow State University) - Shorkunov, Iliia (Institute of Geography, Russian Academy of Sciences) - Pelevin, Andrey (Moscow State University) - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences)
Presentation Format: Oral
- Suzdal Opolie, the central region of North-Eastern Rus', is known as the territory where barrow cemeteries were widespread in the Viking and Post-Viking period. However, recent field investigations and evaluation of the maps of medieval necropolises and settlements have shown that the number of mounds is much smaller than the estimated population that could master this space. Can we explain this disproportion by the fact that significant part of the necropolises were destroyed by long-term plowing and other anthropogenic interventions or remained undetected? Our task was to identify remains of leveled barrows, invisible on the present surface at one of the strongly destroyed necropolises.
- Several approaches were tested for the identification and mapping the necropolis's structure: areal drone imaging, geophysical techniques and traditional archaeological methods. It turned out, that implied separately these methods are not effective enough for the search of the structures. The reason is in the variety of natural conditions and anthropogenic processes masking archaeological features, large volume and low speed of archaeological works. Therefore, the task is generally in the delimitation (automatic or not) of the results of all those processes.
- Two principles were developed to make investigations productive. The first is collecting maximum types of measurement data possible within each survey level, regardless of their direct connection to archaeology. In remote sensing it is a multi-temporal and thermal imaging, in geophysics-electrical and magnetic surveys. The set of different type data reflecting the target as well as the masking structures makes the classification task much likely to be solved. In some areas the non-destructive surveys results enabled to perform some archaeological spatial analysis tasks. The second principle is integration of excavation and soil-survey results as training dataset for the interpretation other methods. The efficiency of this integration has substantive influence on data interpretation.
- 7** **BARROW LANDSCAPE OF THE BIELSKA PLANE, NORTHERN-EASTERN POLAND. WOODLANDS WHERE SEPULCHER PLACES ARE PRESERVED**
Author(s): Szubski, Michal (Cardinal Stefan Wyszyński University in Warsaw)
Presentation Format: Oral
- The Bielska Plain lies in north-eastern Poland. It occupies 2800 km², of which over 35% is occupied by woodland areas. Among them one of the oldest forests in Europe, the Białowieża Primeval Forest, a UNESCO heritage site. In the entire Bielska Plain, over 2000 chronologically and morphologically different mounds were located by remote sensing with the use of ALS. However, the ratio of the number of mounds from the Białowieża Forest to the mounds from the rest of the discussed area is ca. 80:20%. This is due to the very well-preserved features with their own anthropogenic landform forming the archaeological landscape. This situation results from the unique nature of protection of the Białowieża Forest, where intense ploughing was highly limited since the fifteenth century. Thanks to this, in this closed area, we can observe a landscape full of mounds in almost unchanged form. In the Białowieża Primeval Forest, prehistoric and early medieval burial mounds coexist with modern traces of the use of forest resources manifesting themselves as a charcoal and a tar kilns. For archaeologist this case creates a unique opportunity for comparative studies between the primeval forest and its currently economically used neighboring areas.
- 8** **DIFFERENT WORLDS, DISTANT EPOCHS, DIVERGENT SOCIETIES AND A COMMON PLACE. A CASE STUDY OF BURIAL MOUNDS FROM MUSZKOWICE, SOUTH-WESTERN POLAND**
Author(s): Przybyl, Agnieszka (Institute of Archaeology, University of Wrocław)
Presentation Format: Oral
- The Muszkowice Forest, a wooded area in the Sudeten Foreland in south-western Poland (Lower Silesia), represents an almost perfectly preserved sacred landscape. It is marked by the presence of dozens of prehistoric and early mediaeval burial mounds. In a fairly small area there are as many as 35 separate burial places, including 16 monumental cemeteries with Neolithic earthen long barrows and 19 clusters of much smaller round barrows, which have been identified thanks to the use of LiDAR scanning. All of the latter were probably much younger than the former, and some of them can be associated with the Early Middle Ages.
- In my presentation I focus on a particular case study from Muszkowice, with the example of early medieval burial mounds and Neolithic monumental barrow co-occurrence in one common place. The excavations carried out in 2018 have revealed two small artificial round mounds which were established in superposition to the Neolithic barrow. Despite previously conducted non-invasive prospection with the use of both airborne and terrestrial laser scanning, the small cremation cemetery had remained hidden. These not very large barrows, with the remains of the cremation burials, were discovered only during the site excavations.
- This case study shows that, even with the use of modern non-invasive methods of prospection to recognize and document archaeological features, with theoretically well-preserved covering mounds, the results obtained do not always fully reflect the real nature of the relics. Therefore a proper archaeological diagnosis, so important in the management of archaeological herit-

age, requires an appropriate and painstaking approach, taking into account the circumstances of a particular case.

The studies presented were conducted with the financial support of the National Science Centre, research project No. 2017/25/B/HS3/01442.

9 ARCHAEOLOGICAL RESEARCH OF THE DARINO-2 BARROW FIELD IN 2017 (METHODOLOGY AND RESULTS)

Author(s): Murentseva, Tatiana - Minenko, Vladimir - Siroshtan, Ivan - Bishutin, Maxim (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The number of archaeological works in Russia has increased due to active constructing. Often terms of the excavation are strictly limited. So we need an appropriate method of work which will allow to explore the monument carefully and in a short time.

The report is devoted to the results of the archaeological excavations of the Darino-2 barrow field. Eight mounds and cultural layer were studied. The method of work consisted of the following stages:

Dividing each mound into 4 sectors, formed by the intersection of 2 stratigraphic baulks. Removing layers according to the relief of the ground surface. Cleaning, drawing and photo of surface after removing of the first layer. Researching a barrow mound embankment through the layers. Fixation the site of each find in accordance with stratigraphic layers. Fixation the plunderer's pits, grave pits and small ditches at the level from which each mound is poured. Removing layer of buried soil. Cleaning and fixation of virgin soil. Studying the stratigraphy of each mound in the baulks. Removing baulks by hands.

During the excavation A.A. Goleva investigated the soil of mounds. They had almost identical stratigraphy. Under the mounds a layer of buried soil was identified. This indicates that the place was mastered by people long before the making of barrows. All mounds were piled on arable land. The presence of carbonaceous fractions indicates the slash-and-burn method of cleaning the area. Thus the territory near the settlement was used for the making of burial mounds.

The studied burials are dated to the period of the XII-XIII centuries.

So this method of work has allowed us to study the stratigraphy of mounds and get information about the stages of development of this area.

218 WHY WE THINK WE KNOW WHAT THEY DID: DATA, EXPERIMENTS AND MODELS OF NEOLITHIC LAND USE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Laabs, Julian (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Baum, Tilman (Landesamt für Denkmalpflege Baden-Württemberg) - Feeser, Ingo (Institute for Pre- and Protohistoric Archaeology, University of Kiel)

Format: Regular session

Rich data about the Neolithic economy is available. Diverse disciplines including palynology, dendroarchaeology, archaeobotany, zooarchaeology, and stable isotope and aDNA research, as well as the study of material culture have all contributed to the current pictures of Neolithic land use, modes of production, and diet. In particular, scholars have sought to understand the practices of animal and plant husbandry; modes of hunting, fishing, and gathering; and the dynamics of woodland use. The linkages between those economic strategies and the limitations imposed by the palaeoenvironment are of high importance for understanding Neolithic societies in their entirety.

In this session, we aim to develop a synthesis of our state-of-the-art knowledge about the processes and strategies of Neolithic land use. We invite presentations regarding primary, subject-specific primary data as well as those focusing on interpretation and the creation of local or regional models of Neolithic human-environment interactions.

Examples of questions and topics of interest include:

- What is the species composition of the natural woodland, and which resources did it provide?
- Which crop plants were cultivated? And how?
- What evidence do we have for different modes of animal husbandry?
- How can we estimate the allocation of workforce?
- How did the economic activities shape the landscape around the sites?
- How are settlement dynamics linked to land use?
- How can we formalize and model human-environment relationships?

The intended geographic scope is temperate Europe, but contributions from other regions are welcome insofar as they expand our knowledge about systems of land use applicable to European Neolithic communities. The ultimate goal of the session is to connect the results and ideas of various disciplines interested in prehistoric cultural landscapes, Neolithic modes of production, and socioecological systems.

1 **WHY WE WANT TO KNOW WHAT THEY DID: MODELERS AND THE MODELS BEHIND THEIR MODELS**

Author(s): Laabs, Julian (Institute of Archaeological Sciences, University of Bern; Oeschger Center for Climate Change Research, University of Bern) - Baum, Tilman (Landesamt für Denkmalpflege Baden-Württemberg)

Presentation Format: Oral

As modelers of Neolithic socioecological systems we want to design well-informed computer simulations of past economic, social and environmental processes and their reciprocal relations. The reason to do so is to gain an understanding of past short-term and long-term dynamics we cannot study or easily explain with the help of the rather static archaeological and palaeoecological record. But we need those records and even more to start, enhance and evaluate the work on socioecological simulation models.

In order to conceptualize and later formalize a representation of a past complex system there is the need to employ and gather relevant data and existing models about the researched topic. Archaeology and ethnology provide ideas about social behavior, bioarchaeological and paleoenvironmental studies fuel discussions about past human-environment relations, aDNA and isotope research bring new evidence about the mobility of past communities. The data and models used for computer models originate from a diverse set of scientific disciplines which are not necessarily concerned with the past. Socioecological simulation models often need to borrow from contemporary research related to and dealing with topics like crop yield or vegetation modeling.

The agent-based simulation models WELASSIMO (Wetland Settlement Simulator) and LUTES (Land Use and Technological Evolution Simulator) are used as examples to exercise some lines of thought involved in the modeling process of socioecological systems. WELASSIMO has been developed to simulate the land use of Neolithic wetland settlements under disputed scenarios of different husbandry regimes on a local scale. Built upon WELASSIMO and GLUES (Global Land Use and technological Evolution Simulator), LUTES operates on a regional scale and investigates long-term land use and settlement dynamics. In our presentation, we will offer a glimpse of what is needed and what is taken from the diverse contributions of the different disciplines involved in the (re)production of the past.

2 **PICKS, AXES AND ADZES AS WEAPONS OF MASSIVE DEFORESTATION? NEW EXPERIMENTS FOR BIG NEOLITHIC TREES FELLING**

Author(s): Beneteaud, Lucie (UMR 6566 CReAAH, Université Rennes 1) - Bernard, Vincent (UMR 6566 CReAAH)

Presentation Format: Oral

Neolithic stone axes and adzes are usually interpreted as tools shaped and used mainly for woodworking and specially tree felling. However, only a few archaeological experiments were documented so far. Our program has been designed to understand how efficient these tools are and how their typology is significant.

This communication is about recent experiments which took place in Brittany (France), implementing various types of reconstituted axes and adzes based on local archaeological artefacts. We performed different techniques on trees from various diameters. Thanks to the 3D models of the tools we made before and after the tree felling, we can measure the evolution of the shape and the wear of the cutting edge.

By typo-functional analysis, the objective of this work is to understand why the typology of the polished stones is that varied and how they are linked to the tree felling techniques. Furthermore we wish to create a reference collection for use-wear analysis.

3 **CYCLIC NEOLITHIC IN THE VALLEY. MIDDLE NEOLITHIC LAND USE IN NORTH-HUNGARY**

Author(s): Bácsmegi, Gábor

Presentation Format: Oral

Investigations at Karancsság-Alsó-rétek, a multi-component site (2 Phases of LBK, Lengyel and 10-11th Century AD) in northern Hungary, began with the opening of three excavation blocks in 2002.

We excavated 84 features in the 3 blocks and collected samples (animal bones, malacology and stone artefacts) from ca. 72 m³ (100-120 t) of anthroposol. In 2008 and 2010 we took 3 core samples from the site and adjacent the stream. Samples were subjected to soil chemical, sedimentological, palynological, and malacological analyses.

The Neolithic farming was very similar in the three different settlement phases, but a few differences were observed in the animal husbandry. The most important domestic animals were goat, sheep, cattle and pig. Hunting for meat was a complementary activity, and the forest provided the opportunity to gather nuts, fruits and antlers. Cultivated garden plots could have been located near the houses or the border of the settlement; the original luvisol had pH conducive to Neolithic cultivation practices.

We could reconstruct a cycles of Neolithic settlement and abandonment in the valley of the Ménes stream. The significant human activity associated with occupation transformed the natural environment permanently only from the Late Bronze Age.

4 HUMAN ENVIRONMENTAL IMPACT AND LAND-USE CHANGES DURING THE MESOLITHIC-NEOLITHIC TRANSITION IN NORTHERN GERMANY

Author(s): Feeser, Ingo (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

Palynological research in context of the Mesolithic-Neolithic transition in the area of the Funnelbeaker North Group has a long tradition. New research during the last decade, including new analyses and re-dating of old records, however, raises the need for a revision of environmental change and land-use strategies during the Mesolithic-Neolithic transition. A region with an above-average number of well dated pollen profiles is the area of Eastern Schleswig-Holstein and Western Mecklenburg in Northern Germany, which will be in focus of the presented study. Hereby, results from different archive types (on-, near- and off-site) provide evidence for human activities on different spatial scales. Palynological analyses of near shore sediments in context of archaeological sites (near-site) allow insights into the local vegetation and settlement dynamics. Combining these with archaeobotanical and -zoological results (on-site) indicate a change of the prevailing subsistence strategy during the Late Mesolithic to Early Neolithic period supporting the idea of a step-wise adoption of agricultural elements. Based on the evidence from regional pollen diagrams, i.e. off-site lake sediment records, these changes can be further attributed to different phases of human environmental impact on a larger spatial scale.

5 HOW TO RECONSTRUCT THE NEOLITHIC LAND USE? LINKING THE LARGE-SCALE ARCHAEOLOGICAL DATASETS, DATA ON SUBSISTENCE STRATEGIES AND MODELLING APPROACHES

Author(s): Kolar, Jan (Institute of Botany of the Czech Academy of Sciences; Masaryk University) - Abraham, Vojtech (Institute of Botany of the Czech Academy of Sciences; Charles University) - Tkac, Peter (Institute of Botany of the Czech Academy of Sciences) - Macek, Martin (Institute of Botany of the Czech Academy of Sciences; Charles University)

Presentation Format: Oral

In contrast to most of the 20th century, archaeology is nowadays working with large-scale datasets comprising diverse information on artefacts, sites, radiocarbon dates, or archaeobotanical and archaeozoological samples. Due to the current development of the computational techniques and capacities, these datasets can be also processed, analysed and used in diverse ways.

The current globalized society is facing major environmental changes and it is concluded that human activities stand behind it. One of the most significant anthropogenic transformations of the environment was the change of land cover through land use. With the beginning of the Neolithic, humans significantly cleared forests for setting up their fields and pastures, they managed the woodland in order to gain firewood and fodder, and all this had an impact on the vegetation and climate. In this paper we will present an approach combining large-scale archaeological datasets covering the whole Czech Republic, available data on subsistence strategies, palaeoecological archives and spatio-temporal modelling. We will focus on questions regarding settlement and population dynamics and its relationship to the extent of land use.

6 BAYESIAN DEMOGRAPHY AS A NEW TOOL FOR PREHISTORIC POPULATION ESTIMATES

Author(s): Hinz, Martin - Hafner, Albert (Institut für Archäologische Wissenschaften Uni Bern)

Presentation Format: Oral

In order to understand human-environment relationships in the past and the dynamics of socio-ecological systems, it is essential to have a robust estimate of population sizes. Size and density of population are crucial factors for the reconstruction of group sizes, the character and range of political institutions for social organization, the constraints and possibilities of economic practice, the number of people available for collective activities, for economic and social exchange systems, and the creation and maintenance of collective identities. And, of course, the human impact on the environment. Most estimates of population sizes currently work on limited spatial scales or use proxies that hardly allow for absolute numbers (e.g. sum calibration). The figures in the archaeological discourses on population density in general currently come from vague sources and are often decades old.

In demography in general, the last decade has triggered an upswing in the application of Bayesian methods, so that a Bayesian demography has been announced. Bayesian demography is currently at the forefront of methodological developments in this area, but has reached such maturity that the United Nations has been using it since 2015 for population forecasts and projections. The Bayesian approach offers the possibility of combining heterogeneous data and at the same time qualifying them in terms of uncertainty and credibility. This is precisely where it becomes very interesting for archaeological data, since they are mostly inaccurate, biased, sparse, simplified and often based on simplistic assumptions.

In this contribution, issues and possibilities of the application of Bayesian demography in the field of archaeological (prehistoric) population size and density estimation will be discussed and the results of a pilot study will be presented, which should lead to a more comprehensive project for the reconstruction of demographic developments in prehistory on a large scale.

A. EARLY NEOLITHIC LANDSCAPE BURNING IN THE BARCELONA PLAIN

Author(s): Pena Pérez, Ana (University of Barcelona) - Riera Mora, Santiago (University of Barcelona; Seminari d'Estudis i Recerques Prehistòriques - SERP)

Presentation Format: Poster

Land use practices played a fundamental part in Neolithic societies, allowing them to resourcefully exploit the environment.

Archaeological records provide us with plenty of information regarding the extent of human occupations and allow us to sense their economic strategies. However, off-site dynamics, which include most part of Neolithic economic activities, are more difficult to assess. To open up the evidence scope, as archaeologists, we usually rely on paleo-environmental records to reconstruct human-environment interactions and help us infer on land use practices.

Sedimentary records hold different types of paleo-environmental evidences, one of them being charcoal particles generated by burning episodes. Evidence of landscape burning has been attested in Europe from the Mesolithic onwards. Fire was used in forest clearance and vegetation management by prehistoric societies. We ought to think that Neolithic farming and husbandry took many forms and that fire was involved in land management in varying degrees across the continent.

In this study we present the microcharcoal analysis of a sediment core from the northeast Barcelona Plain, dated between the 6th and 5th millennium cal BC. A high resolution analysis has allowed us to reconstruct the local fire history of a very specific period in time, when early Neolithic sites are well attested in the vicinity. This fire history reconstruction also reveals the existence of anthropogenic fires during the two hundred years prior to the first known Neolithic occupations in the Barcelona Plain. Hopefully, this results contribute to a larger corpus of land use evidences among Neolithic communities and help us understand the impact that Neolithic economic activities had on the landscape.

225 ORGANIC CONTAINERS AND CERAMIC - SUPPLEMENTARY OR COUNTERWEIGHT?

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Banck-Burgess, Johanna (Archäologische Denkmalpflege, Fachbereich Textilarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart) - Hurcombe, Linda (Department of Archaeology, University of Exeter) - Probst-Böhm, Anja (Archäologisches Landesmuseum Baden-Württemberg) - Böhm, Sebastian (Institut für Ur- und Frühgeschichte, Friedrich-Alexander Universität Erlangen-Nürnberg)

Format: Regular session

Ceramic made utensils are one of the most basic yet regarded as one of the more modest achievements in the cultural development of mankind. The permanence of early populations is closely linked to ceramics for their use in cooking and stockpiling. Today ceramic constitutes one of the most important forms of cultural classification allowing archaeologists to assign artifacts to a particular typological sequence. This is especially the case with prehistoric cultural groups such as the Neolithic and Early Bronze Age periods, which show significant regional and chronological differences.

So far, however, the research has not fully considered to what extent the ceramic made utensils were influenced by the presence and use of organic containers. Thus, watertight, lightweight and extremely stable bark containers had a significant advantage over the heavier and fragile ceramic. Other organic containers, such leather pouches were flexible and robust compared to the ceramic counterparts. Expansive baskets or flexible nets, as three-dimensional containers, may have had a huge advantage over ceramic containers. The function of coiled baskets used for heat is currently being examined.

The Striking collection of ceramic from the Horgener Culture group, 3400 and 2800 BC, in the region of west Switzerland and southern Baden-Württemberg, that is recognised for its coarse, thick-walled and cylindrical style, may indirectly indicate why no fine ceramic has been located and that this type of ceramic was compensated for by organic containers. Basically, the question arises as to what extent ceramics were influenced by the organic containers and what significance these have for early, agricultural based cultures and what conclusions can be drawn from this for the importance of textile manufacture.

ABSTRACTS

1 ORGANIC CONTAINERS – INTRODUCTION

Author(s): Banck-Burgess, Johanna (Archäologische Denkmalpflege, Fachbereich Textilarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart) - Probst-Böhm, Anja (Archäologisches Landesmuseum Baden-Württemberg) - Böhm, Sebastian (Institut für Ur- und Frühgeschichte, Friedrich-Alexander-Universität Erlangen-Nürnberg)

Presentation Format: Oral

The THEFBO research project is attempting to shed light on the importance of textile products for the early agricultural settlers as they began a more sedentary lifestyle. As often mentioned, livestock and domesticating crops are milestones in the context of sedentariness. Terms like "pre-ceramic" indicate how significant ceramic vessels were in this context and there is no question that implements made of stone, silex, bone or wood were all essential for early agricultural settlements on a day-to-day basis. The significance of textiles, however, remains largely unresolved often only coming to light in the context of linen and wool and the process of weaving.

In this context, the focus of this EAA-session is on organic containers. Their exposure should help to highlight their emphasis and support a different approach when considering the ceramic spectrum of Neolithic cultural groups, such as Horgen culture. Which functions did the organic container have and was it possibly correlated with the ceramic vessel? Organic containers in their entirety, are lightweight, break-resistant, flexible, heat-retaining and waterproof, a far broader range of applications are open to this type of vessel in comparison to the fragile ceramic which was indispensable mainly because of the resistance to heat. The session serves as the first assessment and basis for open discussion on this topic.

2 THE BLESSING OF LBK-WELLS. FIRST NON-CERAMIC VESSELS IN EARLY NEOLITHIC LBK-CULTURE

Author(s): Staeuble, Harald - Wagner, Gabriele (Archaeological Heritage Office Saxony)

Presentation Format: Oral

For more than the last 100 years ceramic was the main archaeological artefact category for Neolithic studies in central Europe. While ceramics was seldom analysed to reconstruct its use and function in day to day life, it mainly helped to define archaeological cultures and determine chronotypological phases.

Mostly from the 1990ies onward an overwhelming amount of LBK wooden wells were discovered, excavated and analysed in central Europe. It is from there that we learnt to know about completely new categories of vessels and containers, mainly made out of thinned bark or sheets of bast. Most of them are interpreted as vessels to fetch water and this not only because they have been found in wells – which is but a matter of the preservation possibilities. The used material and the construction differs slightly, but we already can define different some types, which allow us to also recognise bark and bast fragments which are not well preserved. We will present about a dozen examples from LBK-wells, which have been discovered in Northwestern Saxony and show, that ceramics must have formed only a small part of household inventory of containers.

3 BARK CONTAINERS

Author(s): Banck-Burgess, Johanna (Archäologische Denkmalpflege, Fachbereich Textilarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart) - Probst-Böhm, Anja (Archäologisches Landesmuseum Baden-Württemberg)

Presentation Format: Oral

Gaps in research have potential to expand our knowledge if the information is recognised. A good example are the bark containers and their importance in everyday life of early agricultural orientated settlements. In the archaeological context, bark vessels are often refer to as Russian birch pots, which seems to have been passed on in the context of folklore. Less known, however, is that the Nordic relatives were not only using these containers as boxes but also, after making necessary changes, using them as thermos flasks in order to keep hot liquids warm. Comparing the finds from Neolithic lake settlements around the foothills of the Alps with the finds made of Russian birch made boxes did not succeed especially in terms of quality of the birch because this was grown in a climate that differs from central Europe and is therefore not suitable for producing bark vessels. However, so-called “Omele” which are still used as containers made from lime bark in the southern German town of Belsen during the cherry harvest, have shed light on a previously grey area of research. These lightweight and unbreakable containers have an unmistakable advantage over ceramic vessels. Findings from Alpine region lake-side settlements that have been analyzed appear to exhibit similar seam techniques in terms of manufacturing technology. Findings from the Swiss settlement of Yverdon (Kanton Waad) demonstrate how sophisticated these sewing techniques were. The remains of vessels made of lime bark that have been found at the Alpine lake-side settlements now begin to allow us to rethink the significance of the know ceramics vessels within the everyday life of the Settlements.

4 BIRCH BARK – THE MATERIAL AND ITS PROCESSING WITH REGARD TO THE EXAMINATION OF THE EARLIEST KNOWN NEOLITHIC BOW CASE

Author(s): Klügl, Johanna (Archaeological Service of the Canton of Bern; Bern University of the Arts; University of Bern) - Hafner, Albert (University of Bern) - Di Pietro, Giovanna (Bern University of the Arts)

Presentation Format: Oral

Due to its flexible and water-repellent nature birch bark has been widely used through history for the production of a variety of objects, ranging from vessels, shoes, hats to canoes and manuscripts. However, knowledge on the material itself and its processing in the archaeological context is limited because archaeological finds made of birch bark are extremely rare compared to the number of inorganic finds usually discovered. Bark, like most organic materials is preserved either in waterlogged environments or ice patches/permafrost.

This presentation will introduce the material birch bark, its properties and the processing from the harvest to the production of objects. A special focus will be put on the earliest example of a bow case ever found. This Neolithic bow case is made of birch bark, measures 1.7 m in lengths and is dated to 2850 BC. Between 2003 and 2005 it thawed out of a receding ice patch at the Schnidejoch Pass in the Bernese Alps of Switzerland. It is an archaeological object of outstanding value, since it is the only existing bow case from prehistoric Europe and is the only Neolithic birch bark container built of differently orientated and superimposed strips. A detailed description of the complex structure gives information on the technology available to Neolithic hunters. The properties of birch bark illustrated in the talk will explain why they used birch bark as manufacturing material to protect the bow.

5 WOODEN CONTAINERS IN NEOLITHIC EVERYDAY LIFE

Author(s): Böhm, Sebastian (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Presentation Format: Oral

Pottery is one of the numerically largest find category in archaeology. As a result, it has received and still receives much attention in research. Pottery has undoubtedly played a significant role in Neolithic everyday life. Nevertheless, this dominance within the finds is only due to the fact that pottery outlasted the millennia in almost any soil environment, while organic materials have preserved only under specific conditions.

The importance of organic containers in Neolithic everyday life, however, has hardly been studied. Though, organic containers must have played an important role in the Neolithic household, as several finds from the circum-alpine pile-dwelling settlements show. Especially in the Horgen culture mostly only large cooking pots and storage containers were made of pottery, while other containers such as dishes, bowls, cups and ladles were made of wood. In particular, the so-called Horgen cups are in their filigree in stark contrast to the coarse and thick-walled Horgen pottery. For some so far unexplored reasons, the Horgen culture group obviously preferred wood for the production of certain vessel shapes. But even before and after the Horgen culture wooden containers were present in the household inventory, though not so numerous.

Taking into account the poorer chances of preservation, wooden containers may have been as important as pottery, or were perhaps even produced in larger quantities, as it can be assumed for the Horgen culture.

Using examples from selected pile-dwelling settlements of Southern Germany and Switzerland, Neolithic wooden containers are highlighted and their advantages and disadvantages compared to pottery are shown. In addition, consideration is given to where wooden containers could have acted as a supplement or as a counterweight to pottery.

6 DUNG-MADE POTS FROM THE CORDED WARE PERIOD? A CONTRIBUTION TO THE OFTEN-FORGOTTEN HISTORY OF STORAGE CONTAINERS MADE OF PERISHABLE MATERIALS

Author(s): Prats, Georgina - Antolín, Ferran (IPNA/IPAS, Dept. of Environmental Sciences, University of Basel) - Berihuete, Marian (Dept. of Botany, University of Hohenheim) - Ismail-Meyer, Kristin (IPNA/IPAS, Dept. of Environmental Sciences, University of Basel) - Harb, Christian (Office for Spatial Development, Cantonal Archaeology Zurich)

Presentation Format: Oral

During recent excavations at the site of Zürich-Versicherung (Switzerland), six superimposed Neolithic and one Bronze age occupations were found. Some of the layers presented excellent waterlogged conditions of preservation. Due to the high interest of the site a rather infrequent systematic grab sampling of large fragments of charred organic material was undertaken. The goal of this was primarily towards the documentation of potential food remains similar to those discovered in the nearby location of Zürich-Parkhaus Opéra. These objects were individually checked under the binocular and, unexpectedly, more than a dozen of fragments of vase-like charred organic objects were found, belonging to the Corded Ware occupation about 2700 BC. Three of these objects were investigated with a Raster-Electron microscope and multiple plant components were detected (straw, grains, leaf fragments, trichomes), all indicative of their organic nature and, most likely, of the fact that the raw material for their production was dung.

For this presentation we will also include micromorphology analyses aiming for a more fine-scale reconstruction of the production process of these vessels and we will eventually put their investigation into a wider context of the use of dung as raw material in traditional societies and the purposes of dung-made containers. Similar containers might be present in other settlements but the chances that they get preserved are very low. In this case, it was only thanks to the charring process, their in situ recovery during the excavation and the waterlogged preservation conditions, which are also more favourable for the preservation of charred remains.

7 DECIPHERING FUNCTIONS, ROLES AND MEANINGS OF CONTAINERS IN MOBILE SOCIETIES: A VIEW FROM THE NORTHERN FORESTS

Author(s): Piezonka, Henny (Christian Albrechts University Kiel)

Presentation Format: Oral

Ceramic vessels have been an integral part of the material culture of many mobile hunter-gatherer groups in Afro-Eurasia and the Americas ever since their first appearance in Late Glacial Eastern Asia, and we know today that pottery is by no means necessarily connected to sedentary lifestyles. Over the last years, much research has been devoted to the origins and typological developments as well vessel use and functions of early hunter-gatherer pottery across Northern Eurasia.

Due to the nature of the evidence, however, our understanding of container technology and use is probably severely biased towards ceramics in comparison to vessels made from organic materials that generally perish from the archaeological record. Questions concerning the technological and social significance of ceramics within this continuum remain largely open and often even unasked: What are functional properties, advantages and disadvantages of vessels and containers of different materials such as bark, woven or knotted bast, carved wood, sewn horn but also pottery and metal? How important are combinations of materials, and how might organic parts and components have influenced pottery vessel morphology, functionality, and style? How do technological properties, material values and non-functional aspects influence possible symbolic and ritual connotations and uses of vessels made from different materials?

The talk will draw on ethnohistoric and ethnoarchaeological evidence from the Western Siberia taiga to investigate the spectrum of organic and inorganic containers used by historic and contemporary hunter-gatherer-fisher communities, and to identify associated technologies, roles and meanings. The information will be discussed against a wider background of archaeological evidence from North Eurasian mobile societies and from ethnographic records from the Northeast American forest zone.

8 LEATHER OF THE LAKE – PREHISTORIC UTILISATION OF FISH SKIN PRODUCTS AROUND LAKE CONSTANCE

Author(s): Vávra, Roman (Slovak Archaeological and Historical Institute)

Presentation Format: Oral

Fish skin, whether used raw or processed into leather, is a material in many ways similar to the skins and hides of mammals, reptiles and birds. Yet there are differences and not just in the technological sense. Fish skin might have had its own socio-economical specifics. While archaeological finds of mammal skin and leather are uncommon, yet known, we have almost no finds of fish skin products. Our sources are therefore found mainly in ethnographic studies, where the use of fish skin is well documented. Evidence is mainly from the colder regions, but not exclusively.

In my presentation I will try to recognize the relations between fish skin use and other factors. These include climate, society, available resources, and belief systems. By applying these findings to the Lake Constance area I will discuss the possibility of fish skin being utilised by the local prehistoric populations. The results could then provide a basis for further studies in different regions of Europe and the world.

The presentation was supported by Slovak Research and Development Agency (SRDA/APVV) using financial support no. APVV-14-0550.

9 MOBILITY IN LOCAL AND LONG-DISTANCE TRADE: NEOLITHIC BACKPACKERS

Author(s): Reichert, Anne (Independent researcher) - Schlichtherle, Helmut (Archäologische Denkmalpflege, Feuchtbodenarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart) - Banck-Burgess, Johanna (Archäologische Denkmalpflege, Fachbereich Textilarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart)

Presentation Format: Oral

Mobility and the exchange of goods and the transfer of knowledge have been responsible for changes and development of individual cultural groups that in turn determines the cultural history of such groups.

The transport of raw materials or objects of any kind, be it over a short distance, for example from a forest to a settlement, or over a long distance, is one of the elementary activities in the lives of individual hunters and collectors or in a settlement. A backpack with supporting frame would have been indispensable for longer distance, especially gone on foot. Without such supporting frames, which were shaped for the person and therefore allowed the carrier to have the hands free would have been inconceivable over a long and laborious distance.

The wooden remnants, which were found at the location of Ötzi, the man in the ice at Hauslabjoch, Ötztaler Alps, showed such a supporting frame. In the humid soil of the settlement at Hornstaad-Hörnle, Lake of Constance, remnants of wooden frames and textile network had been preserved. The archaeotechnician Anne Reichert tried to reconstruct a backpack with supporting frame.

What has been described by Helmut Schlichtherle as a backpack from pile-dwellings has far reaching significance that cannot be underestimated in its use for the transport of material and/or goods over a long distance.

10 IS IT POSSIBLE TO COOK WITH COILED BASKETS?

Author(s): Probst-Böhm, Anja (Archäologisches Landesmuseum Baden-Württemberg) - Hurcombe, Linda (University of Exeter, Dep. of Archaeology) - Rimkutė, Virginija (Vilnius University)

Presentation Format: Oral

Looking at the objects that can be found in a Neolithic household the question often arises whether the displayed organic containers are only used for storing solid food or if they had different functions. Especially with coiled baskets this assumption must be questioned. Finds of coiled baskets with adhere burnt remains of food suggest that they have been used for the preparation or fermentation of food and perhaps also for cooking. Ethnological comparisons seem to confirm this assumption, as there are groups of First Nations in North America that did not use any pottery at all. For cooking they used coiled baskets among others.

Against this background, the high number of archaeological findings of coiled baskets from the southern German lakeside settlements seems to get a different meaning. This assumption is intensified when the facts are added that the finds have different shapes, that they are often burned and more often remains of food adhere to the coiled baskets. In order to provide a better understanding of their function and thus of their importance in a Neolithic household, coiled baskets will be examined in more detail within the framework of the textile project "THEFBO". In order to get an indication for what kind of food was prepared in the coiled baskets, the burned food remains will be analysed. Based on these results, the determination of the manufacturing technique and the raw materials, the efficiency of coiled baskets in the preparation of food and in the storage of solid and liquid foods will be checked experimentally.

11 BASKETS MADE OF CLAY – DECORATED NEOLITHIC POTTERY IN ANATOLIA, THE LEVANT, AND MESOPOTAMIA AROUND 6000 BC

Author(s): Franz, Ingmar (ArchaeoBW)

Presentation Format: Oral

Around 6000 BC there is a massive increase in the manufacture of mostly decorated pottery at Çatalhöyük West Mound observ-

able, which is illustrated by estimated 50 times more pottery in these settlement remains than on the ancestral Çatalhöyük East Mound. The pottery assemblage from the West Mound is dominated by light colored serving and storage vessels painted with red geometric decoration patterns resembling basketry decoration, although sometimes incised decorations and appliques are also observable. In general, the vessels show a wider range of shapes and sizes than the vessels from the East Mound. Analyses showed that stylistic and technological characteristics related to basketry technology are typical for the West Mound pottery assemblage. Therefore, it seems likely that, it represents a basketry-imitating blooming stage of Neolithic pottery manufacturing traditions. This introduction of “baskets made of clay” could also have had an impact on the manufacture of basket containers over time, most likely they replaced them. This would perfectly explain the much larger quantities of pottery at Çatalhöyük between 6 000 – 5 800 BC compared to earlier phases. Based on conceptual, stylistic, and technological characteristics this decorated Central Anatolian Neolithic pottery shares many similarities and parallels with contemporary assemblages in Anatolia, the Levant and in Mesopotamia. In fact, it is very likely that many of them are part of the phenomenon observed at Çatalhöyük: Pottery is imitating basketry, and the increasing pottery quantities and the increasing diversity indicate a shift away from organic basketry containers to mineral basketry-looking vessels, roughly between 6200 and 5800 BC. It seems, that the different pottery styles are following their local, already centuries-old basketry traditions, and show us the high diversity of Neolithic basketry in the region.

A. A BUCKET-SHAPED VESSELS IN THE PRZEWORSK CULTURE

Author(s): Okonska, Magdalena (Institute of Archaeology Jagiellonian University)

Presentation Format: Poster

Vessels and containers in prehistory had varied functions and purpose, they could be made of clay, wood or other material, and were produced by craftsmen in workshops of various specialisations. It seems that vessels made of organic material were commonly used by the Przeworsk culture population, which is confirmed, among others, by the numerous metal fittings of wooden caskets and buckets discovered in burials from the Roman period.

The studies of the organic vessels are to some extent possible through the analysis of analogical ceramic vessels. Among the typical sets of tableware, kitchenware and storage vessels commonly used in everyday life, the rare category of bucket-shaped vessels draws attention. It is probable that this category of pottery dated mostly to the Late Roman period and the Migration period, can be interpreted as clay imitation of wooden buckets. This claim is demonstrated by their characteristic form, as well as the horizontal handle attached to the rim, and in some cases also by the style of decoration that could have been inspired by the shape of wooden examples.

The poster aims to present the rare category of the pottery vessel form the Przeworsk culture that seems to be inspired by the organic original. Interestingly, despite its simplicity, it seems that this type of vessels was used only during the short period (probably IV and V century AD). The finds from the area settled by the Przeworsk culture population will be analysed in the context of other similar discoveries from the central European Barbaricum and its possible inspirations coming from nomadic peoples inflowing into Europe at the time.

228 LIVING ON THE EDGE? NEW ADVANCES ON PERIPHERAL SPACE IN PREHISTORY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Gerling, Claudia (University of Basel) - Scharl, Silvine (University of Cologne)

Format: Regular session

For a long time, the analysis of peripheral space in prehistoric societies was strongly connected to the core-periphery concept of Wallerstein's world-system theory and thus became heavily focussed on one particular perspective. However, the emphasis has recently shifted towards more regional and local perspectives with studies focusing on particular economic, ecological or social aspects, facilitating multifaceted insights into areas that for a very long time were only peripheral to archaeological research.

So what happened in peripheral zones and how can we identify this archaeologically? Our session will bring together archaeologists, archaeobotanists, archaeozoologists, geoarchaeologists and archaeological scientists to discuss the current understanding of peripheral space in a diachronic perspective. We welcome papers on case studies, theoretical aspects, and overviews, focusing on economy (e.g. economic specialisation, diversification of subsistence economies, parallel economic systems), settlement and land-use patterns (resettlement, off-site data), environment, mobility and pastoralism, use and social organisation of space, and human interaction and contacts in and with peripheral areas.

The overall aim of this session is to review the current state of research on peripheral space in order to gain a deeper understanding into areas that – despite their marginal location – were central to prehistoric everyday life.

ABSTRACTS

1 NEW ADVANCES ON PERIPHERAL SPACE IN PREHISTORY – AN INTRODUCTION

Author(s): Gerling, Claudia (University of Basel, Integrative Prehistory and Archaeological Science) - Scharl, Silvine (University of Cologne, Institute of Prehistoric Archaeology)

Presentation Format: Oral

For a long time, peripheral space - either on a local or on a regional scale - has not played a major role in archaeological research. This has recently changed, however, and various current research projects systematically investigate peripheries from different, often transdisciplinary perspectives by looking at economic, environmental, social and cultural aspects. The key research questions of the recent approaches can be narrowed down to the following: What happened in peripheral zones and how can we identify this archaeologically? What role played peripheral space in the everyday life of prehistoric people? And last but not least how "peripheral" is peripheral space? These questions are addressed using methods deriving from archaeology, geoarchaeology, archaeobotany, archaeozoology or archaeological sciences. We would like to introduce our session with an overview of current developments in the field of research on peripheral space with the aim of interconnecting the following presentations and pinpointing future developments in this field.

2 PERIPHERY IS THE NEW CENTER. ON CHANGING PATTERNS IN LBK SETTLEMENT DISTRIBUTION AND ORGANISATION

Author(s): Staeuble, Harald (Archaeological Heritage Office Saxony)

Presentation Format: Oral

While all typo-chronological aspects of LBK-settlement organisation in space and time mainly rely on densely distributed finds and features in what is called or thought to be the center of a settlement, the 'poorer' periphery of it is mostly unknown, sometimes superficially checked or even neglected. This is not only due to the need of large amounts of archaeological material to analyse it in order to sequence and interpret it, but also a matter of the possibility of doing comparable large surface analysis. Detailed analytical studies often must limit to small excavated, mostly 'central' settlement areas or in the best case to the 'richer' parts of larger ones. If excavated at all, less dense settlement areas cannot be analysed in the same way, mostly because of the simple reason that there is less or no comparable archaeological material at all. While the factual problem cannot be changed, the methodological aspect strongly has to be regarded while trying to draw larger pictures of settlement organisation during LBK. These aspects will be highlighted by a number of key settlement excavations and studies in the region of Northwestern Saxony, Germany.

3 OFF-SITE ARCHAEOLOGY IN THE LIGNITE OPENCAST MINING AREA IN NORTHWEST GERMANY

Author(s): Scharl, Silvine - Knura, Sebastian (Institute of Prehistoric Archaeology, Cologne University)

Presentation Format: Oral

In many cases, the discovery of archaeological remains that can be characterized as "off-site" is left to chance. Due to high costs and a lack of predictability concerning success, systematic research is still rare. However, the removal of vast areas of soil by lignite opencast mining in the Rhineland/Northwest Germany opens up the possibility for extensive diachronic archaeological survey programs that are not focused on limited areas within selected settlement sites or cemeteries. In the context of the "LANU-Project" (Prehistoric Land Use in the Rhenish Opencast Mining Area) systematic surveys in the periphery of prehistoric settlements (Neolithic to Metal Ages) are conducted in search of off-site features. This involves a combination of different approaches including field survey, geomagnetic survey and test trenches. The project aims at gaining a better understanding of the role and use of peripheral space. This is complemented by a collection of data on already known off-site features from this area. Together with new discoveries the collected data provides the basis for a systematic comparison of off-site and on-site features/finds facilitating a more detailed characterization and differentiation. The paper will present methodological aspects and first results of the project.

4 GEOARCHAEOLOGY OF ANCIENT SOILS AND OFF-SITE FEATURES

Author(s): Eckmeier, Eileen (Ludwig-Maximilians University Muenchen) - Gerlach, Renate (LVR-Amt für Bodendenkmalpflege im Rheinland)

Presentation Format: Oral

The analysis of soil material that was preserved in archaeological features can deliver geochemical information about environmental conditions and anthropogenic activities at the time the sediment was deposited, even though macroscopic artefacts are missing. Geoarchaeology can therefore be a valuable tool for investigating past human activities at the edges of habited areas, and examples for geochemical and sedimentological analysis of off-site features will be presented here.

A main focus will be on Schlitzgruben, which usually appear at the edges of prehistoric settlements, and which could be described as an intermediate pit feature between on- and off-site. They have rarely been investigated in greater detail, also because they usually do not contain any archaeological findings. Their function is under discussion since they were firstly documented, and theories cover a variety of uses. One of the first explanations is having a current renaissance, the function as a hunting pit. Often

the pits were constructed after the settlement was deserted, which means the area was a clearing in the forest that is attractive for game for feeding and therefore also as space for hunting. Examples from the Rhineland strengthen this hypothesis. Although Schlitzgruben have mainly been found on or close to Neolithic settlement areas, and although they are usually filled with Neolithic dark soil material, their stratigraphical position showed that they were dug after the Neolithic structures have been deserted. The pit fillings never contained bone fragments and hardly any charcoal particles. Therefore, only two ¹⁴C-ages are available, which both date to the Mesolithic and early Neolithic. Additionally, OSL (optical stimulated luminescence) dating of the time the Schlitzgruben were filled with sediment revealed ages between the Mesolithic period and the Middle Neolithic.

5 LIVING AND WORKING ON THE PERIPHERY OF THE ROMAN TOWN OF COLONIA ULPIA TRAIANA (CUT)

Author(s): Deschler-Erb, Eckhard (Universität zu Köln, Archäologie der Römischen Provinzen)

Presentation Format: Oral

The Roman town of Colonia Ulpia Traiana (CUT) was located in what is now Xanten but never saw any further construction in post Roman time. Archaeological research and excavations have been carried out in the area of CUT since the 16th century and particularly since the 19th century, culminating in the founding of the LVR Archaeological Park (APX) in 1973. Thanks to legislation protecting archaeological monuments, archaeologists have today an opportunity to explore all facets of a Roman town in one of the north-western provinces. The APX is an ideal environment for future archaeologists to learn their craft in the field and to improve on their existing skills. A four-year research project (2016-2019) run by the Archaeological Institute of the University of Cologne on one hand provides a training opportunity with regard to all aspects of modern excavation, including 3D surveying and 3D documentation, and on the other allows researchers to scientifically study a hitherto largely unknown residential quarter of CUT (Insula 22) in greater detail.

The primary focus of the excavations is a large multi-phase building on the northern periphery of the ancient quarter from the time of the colonia (from the late 1st century AD onwards), one of the features of which was an elaborately designed entrance area with a water basin. Pits full of a vast array of materials found beneath this building point to an early phase of Roman settlement in Xanten which began in the early 1st century AD.

Within my presentation I want to have a look on the periphery of Roman Towns. Has there been the quiet place for the wealthy people or the place for craftsmen's establishments or the place for lower class people?

6 THE MULTIPLE LAND-USE IN THE 5TH MILLENNIUM BC FROM THE PERIPHERAL SPACE PERSPECTIVE. SULTANA-MALU ROȘU, A CASE STUDY

Author(s): Lazar-Radus, Catalin Alexandru (ArchaeoScience#RO, Research Institute of the University of Bucharest - ICUB, University of Bucharest) - Balasescu, Adrian ("Vasile Parvan" Institute of Archaeology of Romanian Academy, Bucharest)

Presentation Format: Oral

The analysis of the land-use models of the prehistoric communities represents a significant tool that can provide information about allocating and managing the environment by the past people, both regarding socio-economic and landscape constraints, but also on the peripheral space use.

Benefiting from an ideal archaeological situation in the case of Sultana-Malu Roșu site (Romania) that consist in a flat settlement, a tell settlement, an off-tell habitation, and three cemeteries from 5th millennium BC, the approached case is very well suited for identification of the social, economic, and environmental elements which may reflect several implications for the nature and spatial configuration of land use. The settlements and cemeteries cover more than 1000 years (ca. 5000-3900 cal. BC) and belong to Boian and Gumelnita communities.

Based on archaeological, micromorphological, topographical, GIS, zooarchaeological, malacological, palynological and carpological data, the current paper will explore the development of local communities from Sultana-Malu Roșu along the 1000 years in terms multiple land-use (e.g. for habitation, burying the dead, other economic activities), exploitation of the environment (natural resources) and human impact.

Moreover, the situation from Sultana-Malu Roșu site allows identifying how the peripheral concept is differentiated perceived by the past communities following changes recorded in the land-use patterns over time.

This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P4-ID-PCE-2016-0676, within PNCDI III.

7 UNDERSTANDING AGRICULTURAL DYNAMICS DURING THE 5TH MIL BC IN CENTRAL EUROPE - A CLOSER LOOK AT PERIPHERAL SETTLEMENT AREAS

Author(s): Scharl, Silvine (Institute of Prehistoric Archaeology, Cologne University) - Stobbe, Astrid (Institut für Archäologische Wissenschaften, University of Frankfurt a.M.) - Roepke, Astrid - Zerl, Tanja - Nolde, Nadine (Institute of Prehistoric Archaeology, Cologne University) - Suhrbier, Stefan (Institute of Prehistoric Archaeology, Free University of Berlin)

Presentation Format: Oral

The advent of agriculture in Central Europe during the second half of the 6th mil. BC constitutes a fundamental change in prehistoric everyday life. However, our knowledge on Neolithic agriculture is somewhat sketchy. We have a quite detailed notion of the earliest agriculture during LBK, that was particularly focused on fertile loess soils and can be characterized as small-scale

horticulture. In addition, during the last years, research has focused on the 4th mil. BC, when profound changes in agricultural techniques occur in the archaeological record. In this context the use of fire (slash-and-burn), a growing significance of animal husbandry or ploughing are discussed. More generally, processes of economic diversification and the colonization of previously unsettled areas outside the loess areas (e.g. lakeshore settlements, northern lowlands) have been documented. These dynamic developments are rooted in the 5th mil. BC that is, however, only poorly understood since research on agriculture of this period (e.g. from Grossgartach-, SBK-, Roessen- or Bischheim contexts) is still rare in Central Europe.

A closer look at the archaeological record indicates, for example, a first expansion beyond the Central European loess zone during the middle of the 5th mil. BC (Roessen and Bischheim). This is accompanied by the use of new cereal types like naked barley and tetraploid wheat. Moreover, the repeated use of peripheral space within already existing settlement areas (e.g. East Wetterau) and of the uplands (e.g. Vogelsberg, Eifel), possibly in the context of animal husbandry, has been documented. The paper aims at identifying the starting point and understanding the causes and consequences of these developments based on an interdisciplinary view (e.g. settlement and landscape archaeology, macro-remain- and pollen-analysis, archaeozoology, geoarchaeology) on the periphery of middle Neolithic settlement areas, where these dynamic developments become visible.

8 «PERIPHERAL GRAZING» - AN ISOTOPIC INVESTIGATION OF PREHISTORIC ANIMAL HUSBANDRY IN THE SWISS ALPS

Author(s): Gerling, Claudia (University of Basel, Integrative Prehistory and Archaeological Science) - Doppler, Thomas (Kanton Aargau, Departement Bildung, Kultur, Sport, Abteilung Kultur, Kantonsarchäologie) - Kruse, Kristin (Canton of Zurich, Building Department, Office for Spatial Development, Archaeology and Cultural Heritage) - Pike, Alistair (University of Southampton, Department of Archaeology) - Reitmaier, Thomas (Archaeological Service of the Canton of Grisons)

Presentation Format: Oral

Alpine high mountain valleys have not always been in the centre of interest of archaeological research, mainly due to the infrequency of archaeological remains in these heights but also due to the difficulty of identifying human impact beyond settlements. Melting glaciers and the recent discovery of spectacular finds have, however, strongly increased the interest in high alpine archaeology. Furthermore, "new" methods facilitate the exploration of the peripheries of alpine settlement sites.

For more than a decade, Alpine pastoral economy in the Lower Engadine (Grisons, Switzerland) has been investigated using a large variety of disciplines. Archaeological evidence revealed the contemporary existence of settlement sites in the valleys and high-altitude huts and animal pens indicating the seasonal presence of humans and animals in these high mountain valleys and as early as the Bronze and Iron Age. Moreover, organic residue analyses have (for the first time in this Alpine region) proven alpine dairy production for the Late Bronze Age. Isotopic analysis provides the potential to directly access seasonal animal mobility. Here, we present the results of strontium LA-ICP-MS and oxygen isotope analyses of cattle (18–9th cent. BC) from the settlement of Ramosch-Mottata in the Lower Engadine. Combined with a GIS- and equation based scenario evaluation on economic strategies and the theoretical carrying capacity of the settlement, we try to gain a better understanding of land use, animal keeping patterns and the relation between the high-altitude archaeological structures and the valley settlements. The combination of different methodological approaches shows a clear socioeconomic shift in alpine animal husbandry and the vertical pastoral exploitation during the Bronze Age in the Inner Alps, possibly in order to increase the output of agricultural produce for exchange within and beyond the Alpine region.

9 IN THE THICK OF IT OR IN THE MIDDLE OF NOWHERE? – ROCK-SHELTERS DURING PREHISTORY

Author(s): Wegmüller, Fabio (University of Basel; University of Zurich)

Presentation Format: Oral

Prehistoric rock-shelter sites (also known by the French term abri) often have thick deposits that preserve long-term records of human activity. As such they represent important archaeological archives.

During the 19th and early 20th centuries, excavations in abris and cave entrances were a popular focus for archaeological research. Numerous sites were excavated, especially those with Palaeolithic remains, although abris with younger prehistoric material were also investigated. Later on, such sites tended to be rather neglected by archaeological research, so few have been excavated to modern standards and the role of rock-shelters within prehistoric economic and social networks is still rather unclear. Often interpreted as being peripheral sites that were only used for short-term occupations from the Neolithic onwards, they became of marginal interest for scientific discussion.

Abri Unterkobel (Oberriet SG) is situated within the Alpine Rhine Valley in north-eastern Switzerland. Excavated between 2011 and 2012, the site has yielded large quantities of archaeological material that span from the Early Mesolithic to the Roman period. The excavation used modern techniques that included large-scale sieving and a comprehensive sampling program. The results of an ongoing interdisciplinary research project studying the archaeological, geoarchaeological and bioarchaeological remains, has revealed new insights into the use of this abri during prehistory.

The aim of this presentation is to shed new light on the function and role of rock-shelter sites during prehistory. The example of Abri Unterkobel and other sites in the Alpine Rhine Valley will be presented and compared with recently investigated abri sites in other regions of Europe.

- 10 LIVING IN HIGH ALPINE LIVING CONDITIONS – LIVING BETWEEN ORES AND ICE**
Author(s): Turck, Rouven (University of Zurich)
Presentation Format: Oral
- Last years prehistoric copper mining and copper smelting was explored by university of Zurich in the Oberhalbstein Vallay (Grison, CH). Several mining galleries and more than 80 melting sites can be detected in mountain environment between 1400 to 2400 masl.
- Living conditions of metal working groups in high altitudes must hat been very hard. Less information of food accommodation, small camps etc. have been found on melting sites. Probably in the lowest parts of the valley around 1400 masl well known settlement of Savognin Padnal was one base for prospecting, mining and melting groups entering the valley. A second settlement vis-à-vis to Padnal called Motta Vallac will be presented in the paper. It was excavated in the 1970ties, finds and features were examined by University of Zurich between 2016 and 2018. In addition several Abris in higher altitudes will be presented to illustrate shortly used camps.
- Apart from agricultural use of high alpine areas copper ores might have been one tracer to enter such peripheral living spaces.
 Information: bergbauprojekt@blogspot.com
- 11 WHEN THE PERIPHERAL BECOMES CENTRAL: A RE-ANALYSIS OF IRON AGE WETLAND LANDSCAPES THROUGH OBJECT DEPOSITION IN WALES AND SCOTLAND**
Author(s): Treadway, Tiffany (Cardiff University, SHARE)
Presentation Format: Oral
- Wetland archaeological sites have long been interpreted as peripheral or marginal locations. When objects are found within a wetland context throughout North Western Europe they are assumed to be of a votive nature, without a comprehensive analysis of cultural practices that would cause such placement within a chosen environment. This project analyses wetland depositional behaviour and placement of material objects dating to the Iron Age throughout Wales and Scotland in a holistic manner. The presentation will provide preliminary results from analysis. These results include emerging patterns of object deposition from the data acquired through museums and private collections or recorded through various digital platforms such as the Treasure Trove and the Portable Antiquities Scheme. One such example of differing wetland depositional practices for the two regions is objects placed within a singular and significant location with repeated deposition of a distinct material type in Wales, as opposed to the sporadic placement of a variety of object types within a common wetland-landscape in Scotland. Therefore, despite pre-conceived interpretations of wetlands as peripheral, taboo, and at times liminal within prehistory, this paper will argue that they played a major role in the development of socio-cultural traditions for the two regions that also reflects similar behaviour with that of the continent.
- 12 THE HISTORICAL DECENTRALISATION OF PREHISTORIC WESTERN JUTLAND**
Author(s): Broch, Mathias (De Kulturhistoriske Museer i Holstebro kommune; University of Copenhagen)
Presentation Format: Oral
- During the 1st millennium AD society in Danish prehistory undertakes significant changes both in terms of social structure and complexity. These processes have on many occasions been connected with new topographies of power and placed in context with an emerging aristocracy that eventually consolidates in a kingly organisation. This national formation narrative draws upon the rich sites spread across Denmark, but simultaneously it marks areas void of such patterns.
- One such area is Western Jutland adjacent to the North Sea – bordered by the Wadden Sea towards the south and the Limfjord towards the north. Sparse traces of contemporary occupancy has been located, and attempts at understanding the region entertain narratives that mirrors how Western Jutland is perceived as a national periphery today. Together these narratives form a regional continuity of marginality through almost 2000 years; even though, adjacency to the North Sea has been placed in context with upholding aristocratic position through luxury exchanges.
- In this paper, I will focus on some of these narratives and investigate their argument and impact on how prehistoric Western Jutland is understood, and how this corresponds with 1st millennium AD settlement and landscape in this area.
- 13 ARCHAEOLOGY IN NORTHEAST HONDURAS: NEW PERSPECTIVES FROM A FRONTIER ZONE**
Author(s): Fecher, Franziska (University of Zurich) - Reindel, Markus (German Archaeological Institute) - Fux, Peter (Museum Rietberg Zurich; University of Zurich) - Cruz Castillo, Oscar (Honduran Institute for Anthropology and History) - Della Casa, Philippe (University of Zurich)
Presentation Format: Oral
- From an archaeological perspective, the modern territory of Honduras is divided into two parts. The western part belongs to the Mesoamerican culture region, while the east is part of the Isthmo-Colombian Area. Although the frontier between these culture regions cannot be understood as impermeable or stable, there are clear differences in the archaeological landscape. Early investigators were impressed by the temples, stelae and hieroglyphic inscriptions they found in the west, especially in the Maya city of Copan, which today ranks among the most intensively investigated Maya sites. In contrast, the further one goes east, the less visible the archaeological remains are. This is a reason why the region has long been neglected by archaeologists and information

on its pre-Hispanic inhabitants is scant. In the beginning of its investigation, archaeologists searched for cultural influences and regional cultures were compared to their more “complex” and better understood neighbors in the west. The Proyecto Arqueológico Guadalupe builds on previous projects that were trying to change the view of northeast Honduras as being peripheral or a passive receptor of cultural influences. Investigations in the Cocal-period (1000-1525 AD) settlement of Guadalupe are addressing questions about cultural and economic developments from a local perspective. Scientific analysis of the extensive materials excavated allows specific statements about local subsistence strategies and networks of economic and social interaction. Preliminary results show that the region cannot be conceived of as dependent or peripheral, but instead subsistence was centered around local resources and obsidian blades with ceramics likely being produced at the site. At the same time, the import of single prestige objects show far reaching connections to Guatemala, Mexico and Costa Rica.

229 COMMUNITIES OF SOUTHERN ITALY BETWEEN THE LOCAL AND THE GLOBAL?

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: de Neef, Wieke (Ghent University) - Attema, Peter (University of Groningen) - Robb, John (Cambridge University)

Format: Regular session

Located at a crossroads in the Mediterranean, the southern part of Italy has been embedded in long-distance networks since prehistory, while it also maintained distinctly local characteristics. The present-day regions of Calabria, Basilicata, Puglia, and Sicily have seen a range of transformative events, cultural contacts, migrations, and political and economic dynamics on supra-regional scale. These include the early arrival of Neolithic agriculturalists, Bronze Age overseas trade, Greek colonization, incorporation in the Roman Empire, incastellamento, feudal estates, and the unification of Italy. Beyond these large-scale historical cycles, however, communities in Southern Italy have developed their own strategies to manage their day-to-day survival, to deal with economic risks and natural resources, to stabilize internal cohesion and (inter-)regional connectivity, and to balance the effects of natural disasters, climate change, geographic marginalization, and broad political dynamics. Phenomena such as brigantism, festivals with a strong pagan character such as the tree festival of Alessandria del Carretto, and enduring Arbëreschë (Albanian-speaking) communities since the 15th century AD are expressions of such local resilience, adaptation, and identity construction.

This session aims to explore how human groups have inhabited Southern Italian landscapes since prehistory and how they have found practical strategies to deal with changing circumstances. We want to look beyond top-down explanations, and invite case studies of local solutions and community structures. We invite critical evaluations of theoretical concepts such as taskscape, landscape niches, and micro-ecologies. We are interested in archaeological, ethnographic, linguistic, economic, historical and cultural heritage studies of all periods and all corners of Southern Italy, and look forward to an active, theoretically and empirically informed discussion about the construction and sustainability of Southern Italian communities.

ABSTRACTS

1 INTRODUCTION: COMMUNITIES OF SOUTHERN ITALY BETWEEN THE LOCAL AND THE GLOBAL

Author(s): de Neef, Wieke (Ghent University; University of Groningen) - Attema, Peter (University of Groningen)

Presentation Format: Oral

Located at a crossroads in the Mediterranean, the southern part of Italy has been embedded in long-distance networks since prehistory, while it also maintained distinctly local characteristics. This session aims to investigate how human groups have inhabited southern Italian landscapes since prehistory and how they have found local survival strategies within broader demographic, economic, political, and environmental trends. Following Butzer (2005), we look beyond top-down perspectives and instead put the spotlight on ‘communities as pillars of resilience’ and active agents in terms of adaptation and identity construction.

We present a case study of a bottom-up approach to understanding local communities of the Raganello basin in the Sibaritide (northern Calabria). The archaeology of this region is traditionally explained from a lowland point of view, with a strong focus on incipient social complexity and issues of (ethnic) identity in the subcoastal zone during the (pre-)colonial periods. Studies by the Groningen Institute of Archaeology in the Raganello basin reveal settlement and land use dynamics integrating the lowlands and the mountainous inlands from the late Neolithic onwards. These observations invite modifications of existing socio-economic and socio-political models for late prehistoric and historic communities, including complementary explanatory frameworks for the many small-scale, ephemeral forms of human activity beyond the major sub-coastal settlement centers.

2 ANTI-POLITICS: NEUTRALISING INEQUALITY STRUCTURALLY IN PREHISTORIC ITALY

Author(s): Robb, John (University of Cambridge)

Presentation Format: Oral

Why was there so little inequality in prehistoric Europe? This paper explores this question, using the Central Mediterranean as a focus. All societies are reproduced according to a bauplan or set of structuring institutions, technologies and practices. These parameters set the constraints and limiting factors of the possibility spaces the societies can exist in, as well as the nature

of the exit routes into other modules of historical possibility. Many institutional factors concern people's responses to the development of possible social inequalities. For instance, in hunter-gatherer societies, mobility limits possible social control. The same is true for the earliest Neolithic societies in much of the Mediterranean; settlements were small, short-lived and fissile. As Neolithic landscapes filled up, one response was to diffuse leadership into heterarchical ritualism, in which ritual leadership was unaccompanied by political or economic control. Neolithic Malta illustrates this setting taken to extremes in a circumscribed setting. Following the structural reorganisation of Mediterranean societies in the later 4th and earlier 3rd millennia BC, the limiting factors were not heterarchy of power sources so much as the fragile nature of hierarchy; an emphasis upon display of wealth rather than accumulation and kinship as an underpinning for politics inhibited the growth of hierarchy. As this show, throughout prehistory, structural factors successfully inhibited the growth of entrenched social inequality.

3 BEYOND PARADIGMS: FOR A PHENOMENOLOGICAL AND POLITICAL MEANING OF THE ARCHAEOLOGICAL LANDSCAPE OF CENTRAL SICILY

Author(s): Giannitrapani, Enrico (Arkeos - Servizi integrati per i Beni Culturali s.c.)

Presentation Format: Oral

A significant contribution of recent archaeological discourse concerns the phenomenological landscape, understood as the symbolic and "political" capability of past and present communities to interact with the environment, determining the development of complex modes of production and reproduction of the material conditions of daily life. The concept of space cannot exist separate from the events in which it is involved: it is socially produced. A humanized space is therefore both the mean and the result of cognitive, physical and emotional actions, a social arena constantly in transformation rather than fixed, made up of different density of human experience. The economic and social marginality that today characterizes the central part of Sicily as described by the narrative on modern Sicily, hides and denies a past that instead was marked by important social processes. Recent researches show, in fact, that here early communities, the focus of this paper, were not isolated and scattered in the desolate heart of the island but, on the contrary, actively participating to the social and cultural dynamics developing across the Mediterranean. The project for a "political" archeology is thus centered on the knowledge, care and protection of the territory as a fundamental tool to restore memories and to reconstitute identities. It promotes a conscious use of local resources, producing new acts of territorialization through shared and participated projects of public archeology, to return cultural and social dignity to local communities. The landscape is "built" by an entire community and its preservation must be shared by the same people that have produced it over the generations, and that lives in it every day, even in the paradox of the awareness of distance that separates from that past and, at the same time, from the perception of its closeness that derives from the frequentation of the same spaces.

4 LOCAL OR GLOBAL? THE MACCHIABATE NECROPOLIS IN FRANCAVILLA MARITTIMA

Author(s): Imbach, Marta - Gerling, Claudia - Pichler, Sandra - Zaugg, Céline - Guggisberg, Martin (University of Basel)

Presentation Format: Oral

The foundation of Greek colonies in southern Italy from the 8th century BC onwards indicates the beginning of an important socio-cultural exchange between the Greeks and the local (Oinotrian) population. Two different cultures converged and merged over time. The Oinotrian necropolis Macchiabate near Francavilla Marittima lies at a distance of about ten kilometres from the Greek colony of Sybaris and was in use from the Iron Age (8th century BC) onwards. Its main usage lies in the pre-colonial period. But burials were still performed in the same necropolis even after the founding of Sybaris, in most cases close by or on top of earlier Iron age tombs, contributing thereby to the emergence of large burial mounds. The tombs of the 8th century BC are distinguished by their metal grave goods and also by the positioning of the body in a lateral, flexed position, whereas in the later, archaic graves the deceased were deposited supine. This change in burial rites seems a clear result of the expansion of Greek culture throughout the Sibaritide in the 7th and 6th century BC. At the same time, the maintaining of local traditions is expressed by the close proximity of archaic and earlier burials. The necropolis is therefore a good starting point to examine the construction of identity in a landscape subjected to deep cultural change in colonial times. Our presentation focuses on the differentiation between "local" and "global" by investigating continuity and change in the burial traditions of the Macchiabate cemetery from the 8th to the 6th century BC and by analysing the interred individuals using osteoanthropology and isotope analysis.

5 A 'GREEK ISLAND' IN SOUTHERN CALABRIA: LANGUAGE IN LANDSCAPE, LANDSCAPE IN LANGUAGE

Author(s): Farinetti, Emeri (Roma Tre University) - Carè, Barbara (Italian Archaeological School at Athens)

Presentation Format: Oral

Two geographically and linguistically distinct enclaves Greek in language are currently settled in southern Italy, as a result of cultural and political interactions between this part of the Italian peninsula and Greece extending back for millennia. Among those, the Calabrian Greek community is currently concentrated in a few villages of the Aspromonte massif, in the southernmost edge of Calabria.

Despite the increase in attention to the question of the origin of this community and to the changes which have affected this "language island" over the centuries leading to a sharp decrease in the number of speakers and the progressive decline of this variety, both in the contexts of academic and popular settings, environmental and topographical factors are still rarely considered as significant issues. This paper outlines the potential of landscape archaeology to contribute to the debate integrating

spatial analysis with semantic and ethnographic data, aiming at a better understanding of this historical phenomenon.

The research concerns the long-term occupational history of this community and explores settlement dynamics and connectivity patterns in the area in a diachronical perspective, looking both at internal and external change agents (such as historical or climatic events) and comparing local narratives to a larger-scale framework of global trends.

Linking archaeological datasets, glossary, semantic material and place-names, it also investigates subsistence strategies and changing tasksapes of the local communities and addresses how landscape is represented in the language and what this reveals about the relationships of people to places and land and to their own cultural identity.

6 MOVING THROUGH THE LANDSCAPE. LOCAL AND REGIONAL MOBILITY IN THE CALABRO-LUCANIAN UPLANDS (SOUTHERN ITALY)

Author(s): de Neef, Wieke (Ghent University) - Larocca, Antonio (Gruppo Speleologico 'Sparviere') - Attema, Peter (University of Groningen)

Presentation Format: Oral

One of the striking characteristics of the Calabro-Lucanian uplands (southern Italy) is the ubiquitous presence of single farmsteads, even in the most remote corners. Some of them are still in use, yet the majority was abandoned in the recent past. These farms reflect the intensive use of the mountainous inlands for agro-pastoral subsistence by seemingly isolated households. This paper focuses on the embedding of Early Modern users of this landscape in wider social and economic systems by looking at mountain mobility and exchange infrastructure. Three levels of mobility are discussed: short-distance movement within a local taskscape, middle-distance vertical migration, and long-distance trade and transhumance routes. The role of crossroads, markets, and festivals is explored in terms of risk management and community integration. Early Modern land use strategies and connectivity provide useful analogies to interpret the late prehistoric archaeological record of the Pollino range, which is investigated since 2006 by landscape archaeological studies of the Groningen Institute of Archaeology. Recent archaeological studies reveal that the Pollino uplands were affected by human presence from the Neolithic onwards, with increasing environmental impact from the Middle Bronze Age as recorded in the palynological record. Traditional drove roads and mountain paths across ridges and passes offer a new perspective on the inland focus of these early inhabitants.

7 EXTRAORDINARY TIMES: NEW PERSPECTIVES ON SETTLEMENT IN SOUTHERN ITALY FROM PREHISTORY TO MODERNITY

Author(s): Foxhall Forbes, Helen (Durham University) - Foxhall, Lin (University of Liverpool)

Presentation Format: Oral

Research in southern Italian landscapes has traditionally distinguished between periods where settlements were focused substantially on the coast, and those which focused more on upland areas, contrasting the societies within them and especially their connections with the wider Mediterranean world and beyond. We argue that largely unacknowledged underlying assumptions about the normality of coastal settlement are deeply embedded in most of the relevant scholarly literature. This has distorted how scholars have valued and evaluated different periods in relation to each other, and thus how trajectories of ascent, growth and decline, or connectedness versus isolation, have been identified and defined in relation to particular societies. We suggest that a perspective which takes as its starting point the normality of upland settlement, identifying coastal settlement as a comparatively extraordinary phenomenon, enables us to build a completely different kind of long-term history of southern Italian landscapes. This approach demonstrates that although the more upland-oriented societies characteristic of some periods operated differently from the more coastal-oriented societies of other periods, connectivity as well as political and economic complexity are demonstrable in periods where upland settlement was the predominant form, contrary to what has often been assumed. One important aspect of this is that the connecting relationships operating across these landscapes were reconfigured according to contemporary settlement and landscape norms and needs. We will explore why and how these relationships and their transformations take place, focusing in particular on two period case-studies, Late Antiquity and the Early Middle Ages, and Iron Age and Archaic/Classical southern Italy, in Calabria and Basilicata.

233 SEAC 27: CULTURAL ASTRONOMY AND ONTOLOGY: HOW CELESTIAL OBJECTS AND EVENTS HAVE FEATURED IN THE BELIEF SYSTEMS AND COSMOLOGIES OF DIFFERENT SOCIETIES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Sims, Lionel - Frank, Roslyn (European Society for Astronomy in Culture)

Format: Regular session

All cultures have a skyscape but their cultural appropriation of the patterns in the sky is variable. Ontological interpretations of this relation have varied from universal claims of the rise of the astronomy of sky objects to relativistic representations of the sky rooted in culture rather than heavenly entities or events. Over the last five decades Cultural Astronomy has developed an inter-disciplinary methodological and theoretical pluralism to meet the challenges posed by this complex association between sky and culture, skyscape and landscape. The session invites scholarly contributions that address how celestial objects and events have been integrated into belief systems across the world. Contributions addressing the way that sky resources have been appropriated by different cultures can also serve as a basis for reflecting on the various conceptual vocabularies developed within Cultural Astronomy for the analysis of these and other related questions. What ethnographic examples of cosmol-

ogy allow us to evaluate closely the extant methods and theories utilized in Cultural Astronomy? Are our concepts sufficiently sensitive to capture and respect the details of a local cosmology? Is there any evidence or justification for universal properties in the skyscape attributes of the world's cosmologies? Or, stated differently, is there evidence for more complex patterns that link the world's cosmologies? And, finally, how can these debates hone and develop the present approaches and methods available to researchers working in Cultural Astronomy? Scholars are invited to present abstracts for papers which address one or more of these concerns and, in the process, can serve to challenge and move the discipline forward.

ABSTRACTS

1 TRACING CELESTIAL PROJECTIONS OF BEAR CEREMONIALISM BASED ON EVIDENCE FROM THE UPPER PALAEOLITHIC TO THE PRESENT

Author(s): Frank, Roslyn (University of Iowa)

Presentation Format: Oral

The field of Cultural Astronomy is closely related to three disciplines (cultural anthropology, ethnohistory, and archaeology) and retrieves its data utilizing techniques and methods drawn from each field. At this juncture, it is important for Cultural Astronomy to develop a rigorous methodology capable of integrating these three types of evidence. The interdisciplinary nature of Cultural Astronomy, the study of astronomy in culture, has been recognized as advantageous by those scholars who have been dissatisfied with the dominant paradigm of modern Western science which divides knowledge into smaller and smaller disciplines. This new area of study reflects the desire to promote interdisciplinary initiatives that, in turn, can promote cooperation between those working in different fields. When approaching the question of how patterns of a people's preterit worldview can be studied, feedback is elicited from archaeological remains combined with relevant ethnohistorical evidence and insights drawn from cultural anthropology. This approach serves as a means of reconstructing cultural knowledge systems in prehistory, albeit always hypothetically, showing how interactions with the environment served to shape the way that skyscape and landscape resources were melded into an overarching worldview, in this case, one associated with bear ceremonialism. Debates over the evidence for the existence of a bear cult during the Upper Paleolithic have gone on for years along with the question of whether survivals of the archaic cosmology associated with historically attested examples of circumpolar bear ceremonialism among hunter-gatherers can be used as proxies for reconstructing this earlier worldview and the skyscape that might have been projected as part of it. In this talk cross-cultural comparisons, supplemented by archaeological evidence, will be used to explore the question of how in times past landscape and skyscape might have been fused through recourse to an animistic belief system centered on bear ancestors.

2 FROM PILLAR TO POST: SYNTHESISING ARCHAEOLOGY AND ARCHAEOASTRONOMY AT STONEHENGE AND AVEBURY

Author(s): Sims, Lionel (European Society for Astronomy in Culture; University of East London)

Presentation Format: Oral

The West Kennet Palisades were an Early Bronze Age (EBA) large oak post double companion enclosure to the Avebury stone circle in Wiltshire, England. Parker Pearson's materiality model proposes an identical dual arrangement of materialities in binary combination between monuments of wood and monuments of stone at late Neolithic/EBA Stonehenge, each of which provides respectively a focus for a domain of the living separated from a domain for the dead. According to this model the 'wooden' Durrington Walls is the companion doppelgänger to the 'stone' Stonehenge. Since Parker Pearson suggests that this model also applies to the Avebury monument complex, then his materiality model is amenable to test through the details of the companion 'stone' Avebury Circle and 'wood' West Kennet Palisades. Since Parker Pearson's model invests lunar-solar alignments to Stonehenge and Durrington Walls, by extension, we would expect a matching 'astronomy' at the Avebury monuments. Recently three independent archaeoastronomy researchers have found a dual ritual syntax in late Neolithic/EBA monument alignments in three different regions of the British Isles. Higginbottom for the West of Scotland and Fisher for the south Wales Prescelli Hills both suggest that paired monuments are located in orthogonally-aligned landscapes for reversed alignments in alternating rituals. Sims suggests that Stonehenge similarly exhibits reversed 'astronomical' and landscape properties but also in diacritical combinations associated with reversed materialities. These precise overlapping design details at Stonehenge across three dimensions – archaeology, landscape and archaeoastronomy - radically reduce the number of plausible interpretations, and suggest that no ritual at one particular monument can be complete without moving on, from pillar to post, to its paired companion monument in a ceaseless alternation. A detailed examination at Avebury of the archaeology and archaeoastronomy of the West Kennet Palisades allows a test for this expectation of inter-disciplinary convergence.

3 WORLD CAVE, WORLD TREE, WORLD MOUNTAIN, WORLD HOUSING: MODELS OF ARCHAIC COSMOLOGIES AND COSMOGONIES TANGIBLE IN OBJECTS, BUILDINGS AND LANDSCAPES

Author(s): Rappenglück, Michael (SEAC)

Presentation Format: Oral

One of the basic concerns of human existence has been the creation of everyday living spaces together with the ability to expe-

rience being in extraordinary places. The structure, arrangement and weighting of living spaces, their classification and embedding in the fundamental orders of space and time have been activities that have occupied humankind at least since the Upper Palaeolithic. These concerns are expressed symbolically, mythically, and ritually in objects, buildings and landscapes. They make experiences and insights about how “the world works” sensually perceptible. Also, the extension and transformation of “normal” everyday world structure into other realities (birth, death, otherworldly existence, ecstasy) were thematised. Key components of archaic cosmologies and cosmogonies, namely, the World Cave, the World Tree, the World Mountain and the World Housing, repeatedly manifest themselves in symbols, myths, rituals, and archaeological records worldwide. They act as impressive mnemonics, manifest in tangible entities, allowing people to conceptualize their lives in an ordered and domesticated space-time, a cosmos, and from there to establish a concept of “horizon”, “centre” and “orientation”, i.e., a meaningful structure. The nature of these models raises questions concerning the whys and wherefores of people and the world since archaic cosmologies and cosmogonies can be understood as holistic, multi-layered models of evolving human ecosystems that help, in symbolic language, to make the world liveable, but also to transcend it. In general, such models extend beyond the astronomical code, delivering ideas about the human realm of experience. Systems of power, justice, and social order derive from them. The talk combines astronomical elements in archaic cosmologies and cosmogonies with archaeological and cultural anthropological findings.

4 DID THE ANCIENT EGYPTIANS INDEED RECOGNIZE THE VARIABILITY OF ALGOL (β PERSEI) ?

Author(s): Krauss, Rolf (Humboldt-University Berlin)

Presentation Format: Oral

Jetsu, Porceddu et al. published between 2008 and 2016 a series of articles in prestigious journals (Cambridge Archaeological Journal 2008; The Astrophysical Journal 2013; Plos One 2015; Open astronomy 2018) arguing that the ancient Egyptians noticed the variability of Algol. The document on which they base their study is a kind of almanac from the 13th cen. BC with prognoses for a lucky or unlucky course of events during an Egyptian civil year, each day divided into three parts with its own prognosis. The authors expressed the sequence of prognoses as a series of time points and checked with the Rayleigh test whether the points are randomly distributed or show periodicity. They found a period which is apparently lunar, but also a period of 2.85 days which they explain as corresponding to the period of Algol’s change in brightness.

Any reference to Algol would create a serious Egyptological problem. Very few stars which are mentioned in ancient Egyptian sources are identifiable and Algol is not one of them. Considering that the variability of Algol was first recognized in 1669 it would be somewhere between beyond belief and marvellous should the ancient Egyptians had monitored Algol’s variability closely and furthermore used the results as basis for prognostication of good or bad luck in every day life. Under these circumstances one may ask whether there is a flaw in the argument of Jetsu et al. Assuming that the Rayleigh test has been employed faultlessly, the question is whether the basic data – i.e. the expression of the series of prognoses as series of time points – is error free. This question is the subject of the suggested paper.

5 INVERTED RAINBOW: THE AESTHETICS OF SAN CELESTIAL PHENOMENA AT THE ‘RAINBOW MYSTERY SHELTER’ IN THE CEDERBERG, WESTERN CAPE, SOUTH AFRICA

Author(s): Hayden, M. (University of the Witwatersrand)

Presentation Format: Oral

The significance of celestial phenomena has been an area of focused interest in the field of rock art studies through an engagement with ethnographic archival material of the nineteenth and twentieth century. While celestial phenomena in San cosmology has been an integral component of rock art analysis, associated colour concepts have not yet featured in ontological interpretation but can inform the study of astral presence in the art. Academic discourse in the field of rock art studies centred on formal iconographical elements of San cosmological celestial phenomena, such as stars and the moon, is enhanced by my formal assessment motivated through an art historical approach, which uncovers attributes of celestial bodies with a particular focus on the correlative interchange through colour. One such celestial phenomenon available through the ethnographic archive with explicit colour reference is the San concept of the rainbow. This paper explores this notion in the archive and its potential resonance to a multi-coloured painted motif at the ‘rainbow mystery shelter’ in the Cederberg, Western Cape, South Africa, along with potential astrological representations of lunar and solar halos. At the intersection of ethnography, science and art, I examine the plausibility of the ‘inverted rainbow’ or circumzenithal arc, as a pictorial motif with attendant cultural associations to weather. The atmospheric phenomenon of the circumzenithal arc as a meteorological weather event indicating an oncoming pressure system bringing precipitation has analogical resonance to San cosmological metaphors for rain and fertility. The creative underpinnings of a discursive aesthetic in San rock art may hold true for other colour-related terms and the impact pictorially may extend current methods available in Cultural Astronomy.

6 SOLSTICE ALIGNMENTS AT ANGKOR WAT AND NEARBY TEMPLES: CONNECTING TO THE CYCLES OF TIME

Author(s): Romain, William (Independent researcher)

Presentation Format: Oral

Built in the early twelfth century, Angkor Wat is one of the world’s largest ancient religious structures. Each year thousands of people visit Angkor Wat to view the equinox sunrise over the center lotus-shaped tower. There are, however, additional celestial

alignments that were also of likely importance. In this presentation solstice alignments are identified for Angkor Wat, Bakong, Phnom Bakheng, Phnom Bok, Phnom Krom, East Mebon, Pre Rup, Banteay Srei, Ta Keo, Baphuon, Preah Khan, and Bayon.

Subsequent to ground and aerial reconnaissance, archaeoastronomic assessments were made of Angkor Wat and nearby temples using Google Earth satellite imagery. More than 70 solstice alignments were identified including 21 solstice alignments at Angkor Wat, alone.

Among the lines of evidence suggesting that these alignments were intentional are their continued incorporation into temple designs even as architectural styles changed over the centuries, as well as iconographic details found in bas reliefs at Angkor Wat.

Together, these and other lines of evidence suggest that it was important for Angkor temples to be connected to the sun. As I will demonstrate, solstice alignments defined the physical parameters of the Angkor cosmos. Moreover, if, as endorsed here, Angkor temples were microcosmic models of the cosmos, then arguably, solstice alignments connected the temples to the cyclic movement of the cosmos.

The findings reported here contribute to our understanding Angkor Wat. In this, we are reminded that when assessing ancient sites, we need to consider relationships to earth, water, and sky. In particular, archaeoastronomic assessments help us understand how people relate to the cosmos through their built structures. Anything less and we risk presenting a skewed picture of the sites we study and the people who once lived there.

7 THE MAKING OF AN IMPERIAL AGRICULTURAL LANDSCAPE IN THE VALLEY OF BELÉN

Author(s): González-García, Antonio César - Saintenoy, Thibault (Institute of Heritage Sciences, Incipit-CSIC) - Crespo, Marta (Independent Researcher)

Presentation Format: Oral

Agricultural planning is not limited to works of terracing, land allotment and hydraulic engineering. As a collective social practice, agriculture also requires the formalization of a corporate coordination system, based on devices such as calendars and ceremonies, which relate the collective of farmers with the space-time of agricultural practice in a given socio-economic and political context.

We present an unusual architectural structure located in the Altos de Arica (south-central Andes), whose circular shape and combination of windows and niches echo the characteristics of a special Inca building of Cuzco's main square: the *sunturhuasi*.

By means of a 3D multiscale modelling-based simulation, we demonstrate the landscape and astronomical potential of this architecture.

The results are consistent with ethno-historical information about the Inca agricultural calendar and related astronomical observation practices. Taking into account the local archaeological context, we suggest that this special architecture constituted a central stage of an imperial built environment related to the political economy of maize production.

8 CULTURAL ASTRONOMY, SKYSCAPE AND ONTOLOGY IN NEOLITHIC IRELAND

Author(s): Prendergast, Frank (Technical University Dublin)

Presentation Format: Oral

The Neolithic passage tomb tradition in Ireland exhibits distinctive typological characteristics - notably in terms of landscape siting, a developed architecture, megalithic art and a characteristic material culture. Culturally, this sets them apart from the other tomb traditions on the island. Although the central role of individual passage tombs was for the placement of mortuary deposits, and grave goods in some cases, archaeologists now advise that the term 'complex' rather than 'cemetery' be used to describe tombs aggregated in dense or dispersed clusters. This approach recognises the likely ceremonial role and extended meaning for all such monuments in the lives and belief systems of the societies who erected them. In that context, this paper further considers the pronounced and striking preference for siting most Irish passage tombs on locally elevated ground, and on the summits of prominent hilltops and mountains. Data analysis suggests an intent to achieve visibility, dominance and power by exploiting topographical height in an elevation and symbolic sense. Such site selection enforces collective community ascent and descent through tiered cosmic levels as part of the religious ritual of death, burial and the journey of the spirit into the otherworld. If height was an important element of tomb ontology, the methodologies and perspectives of cultural astronomy are a potentially powerful contributory tool to explore a range of relevant research questions. For example, is there linkage between the liminality of the horizon visible from tombs and observable solar rising or setting phenomena occurring at seasonally important times? Does the elevated siting of tombs indicate a preference for visibility of the distant horizon sector delimited by the northern solstitial limits of the rising and setting sun? Was the northern dark sky and skyscape perceived as a portal to an otherworld in the journey of the dead?

9 THE REINTERPRETATION OF THE CALENDAR POT OF THE LATE COPPER AGE VUČEDOL CULTURE

Author(s): Pasztor, Emilia (Türr István Museum, Baja)

Presentation Format: Oral

The most characteristic and famous artefact of the Vučedol culture is the calendar pot found at the Croatian town Vinkovci. Although the vessel is incomplete, the structure of its ornamentation can be well observed. The surface is divided into four parallel horizontal zones which are also broken down into panels by vertical double lines. Every other panel contains a motif/symbol pe-

riodically used. Alexandar Durman argues that this ornamentation on the pot represents a stellar calendar. The horizontal zones stand for the seasons. The different signs of a zone denote constellations which were seasonal indications for Vučedol people. These symbols play a significant role in the ornamental art of the Classical Phase.

In contrast, the author argues that the ornamental symbols of the pot show similarities with the abstract motifs on the gaming boards of the Royal Game of Ur dated to 2600 – 2400 BCE. Therefore, the use of these symbols is not constricted exclusively to the Vučedol culture and might play roles in divination. The comparative investigation of the symbols indicates strong intercultural relations with Eastern Mediterranean.

10 COSMIC CONTAINERS - ELEMENTS OF ANCIENT COSMOVISIONS

Author(s): Rappenglück, Barbara (Chiemgau Impact Research Team)

Presentation Format: Oral

The traditions of peoples are packed with wondrous qualities of containers (pots, bowls, jugs, cauldrons, chalices etc.). Vessels may e.g. serve as uterus, they manage transformation and rebirth, and they contain harm and death, abundance and wisdom. Beyond that, containers may manifold relate to cosmic symbolism: A basket represents the whole world (Dogon [West Africa]), a reversed kettle constitutes the heavenly dome (Buryats [Siberia]), the zodiacal constellations are vessels for scooping (Manichaeism), etc. Especially in the context of mythical cosmogonies and cosmovisions the “cosmic container” is a widespread motive, as e.g. the cosmic gourd of Daoism. But also concrete, really existing vessels may be charged with cosmic meanings, with their shape, material, decoration and/or context of use contributing to the cosmic symbolism. The lime containers of the Kogi (Columbia) or decorated ceramic pots of the Shipibo-Conibo (Peru) are examples of such conceptions.

The talk will establish fundamental categories of “cosmic containers”. Furthermore, on the basis of selected examples it will examine how the fact that such vessels often share special qualities as the ones mentioned above contributes to the complex symbolism of “cosmic containers”.

Comparative mythology as well as documented traditions and interpretations of peoples concerning concrete vessels will serve as a basis for this talk.

Literature:

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11 SKYSCAPE ARCHAEOLOGY IN LATE NEOLITHIC MALTA

Author(s): Lomsdalen, Tore (University of Malta)

Presentation Format: Oral

The Maltese Archipelago has some of the world's most unique prehistoric megalithic monuments, often referred to as ‘temples’, chronologically dated to Late Neolithic Malta, also known as the Maltese Temple Period (3,600 BCE -2,500 BCE). Their architectural and spatial structure, iconography, material culture and positioning in the cultural landscape have been extensively explored by archaeologists. However, archaeological research has rarely considered the sky as a cultural resource available to the prehistoric society who built and used these structures.

The monuments have also been studied by both astronomers and archaeoastronomers though largely concerned with astronomical alignments and celestial bodies, often neglecting the wider archaeological record and the human element in cosmology. Despite the shared goals, the two interdisciplinary fields (archaeology and archaeoastronomy) have studied the paradigm of the Maltese prehistoric cosmology mainly in isolation.

Seeking a new understanding of these issues by using new methodologies to extend the works of previous scholars, this presentation shall argue that the Late Neolithic Mnajdra Temple in Malta was built to reflect, if not entirely at least partially, a cosmology that can be studied through Skyscape Archaeology.

12 THE HEAVEN'S CUCKOO: INTERPRETING A EUROPEAN ARCHAIC ASTRONOMICAL MYTH PRESERVED IN THE ROMANIAN TRADITIONS, AND ITS ICONOGRAPHY ON COUNTRY ARTEFACTS

Author(s): Negru, Cristina (Independent researcher, University of Bucharest)

Presentation Format: Oral

The zoomorphic metaphor is a common thing in denominating asterisms throughout history. Choosing icons of either real life or of composite animals (chimera) to represent asterisms is based on different characteristics of such animals and the most important of them seems to be the superposition between their biological rhythm (reproduction season, hibernation, migration etc.) and the moment when the asterism is visible on the sky in different aspects (heliacal rising, culmination etc.).

One of those time-markers animals is the cuckoo. Its characteristics and behavior produced a protean myth with remanences in language, beliefs, artefacts from different cultural areas, from Western Europe to India.

In the Romanian traditional culture, an oral and very conservative culture till very recent times, with a vast patrimony of ritual and

ceremonial texts, very well documented by generations of ethnographers, the cuckoo image survived in a complex myth which irrigate a large number of fields: the old pre-Christianism calendar (with two Day of the Cuckoo, marking the period when its song is audible), funeral songs, tales, beliefs, customs, ethnobotanics, artefacts (pottery, Easter eggs, carpets, shirts).

Interpreting this material from a transdisciplinary perspective, one can notice several isotopisms and narrative structures that lead us to identify the heaven's cuckoo (one of its traditional names) as a representation of an asterism, present on the spring sky, between the spring equinox and the summer solstice. Moreover, the myth produced archetypal icons with specific elements of visual language, still used as traditional patterns on country artefacts from different cultures and times.

The paper presents how the various correlations of the myth with the sky and in particular with the Pleiades, conduct to the identification of a forgotten asterism of the old European sky. Finally, it could be relevant for its methodology in a comparative research context.

A. ASTRONOMIC REFERENCE-POINTS OF THE SACRAL COMPLEX OSTROV-2 IN THE TRANS-URALS

Author(s): Matveeva, Natalia (Tyumen state university) - Potyemkina, Tamila (Institute of Archaeology of Russian Academy of Sciences)

Presentation Format: Poster

The site Ostrov-2 was found and studied on the eastern side of the Urals. It covers chronological period of the beginning of the IV century BC. Forty pits were localized by two circles. Two pits in the center consisted remains of cut head of 7-8 years child, the 18 years woman bones, the scraper and the blade, 4-5 years child skull and the pebble. Other 38 pits rounded human remains. The line «north-south» has marked evidently, the step of hole-pits has been 2-2,5 meters in the inner circle, in the outside circle we haven't stereotypic step size. Four lines painted from the center through pits marked directions to the sunset in summer and winter solstice, sunrise in winter and summer solstice. Eight lines give the directions to the different phases of the Low and High Moon. Half of pits had subjects: flakes, head of arrow, tools on the blades, cores. Pottery of Shapkul' culture belongs to egg-form vessels with decoration of horizontal and vertical belts of combed.

So, the site Ostrov-2 is a woodhenge and place of ritual actions, may be, burial cult which was accompanied by astronomic observations. The rituals with using of skulls are known on the Urals and Siberian sites of Stone age. We interpret that actions with skulls as connected with cult of ancestors and cult of fertility.

234 CROSSING NEW BORDERS: PROMOTING COLLABORATION BETWEEN EU, NON-EU AND EX-EU ARCHAEOLOGISTS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Hinton, Peter (Chartered Institute for Archaeologists) - Schauer, Michaela (ClfA Deutschland)

Format: Discussion session

We cannot guess how EU/UK discussions about Brexit will go between submitting this abstract and the date of the meeting. But with a changed (and unclear) relationship between the EU and the UK, archaeologists of the UK will now have to work harder to promote research, education and communication with their EU colleagues. They may also need to overcome new barriers with other non-EU states. Some of these challenges will be new to UK archaeologists, but others who work across the EU/non-EU border will be familiar with them.

This session seeks constructive papers from all European countries that explore what works, what hasn't worked and why. We want to understand how, practically and emotionally, we can continue to use UK archaeologists' firm identification with and affection for the rest of Europe, for the benefit of all.

It also provides an opportunity for the EAA to update all members on how it serves, supports and champions EU, non-EU (and temporarily EU) archaeologists alike.

ABSTRACTS

1 LORD, WHAT FOOLS THESE MORTALS BE! EUROPEAN ARCHAEOLOGY IN THE PAST, THE PRESENT AND THE FUTURE

Author(s): Spanjer, Mark (Saxion University)

Presentation Format: Oral

Archaeologists tend to worry. And the result of the Brexit referendum and the following developments have not been appreciated by the lion share of those among us who are interested in a transnational Archaeology. In (mock?) despair we call those who want to create the new divide: "Fools." Although, many of us claim to react rationally, if we are honest with ourselves it is in a large part an emotional reflex.

We can be captured by the trend, uncertainty or our 'despair.' But lets not; and seize this moment to look at the early development of European Archaeology. Some accidents and miracles. What we have and share and put that against the needs of the communities (including ours) and society in our shared part of the world. Let's be Fools and swim against the stream. There is

wisdom in that choice. This contribution hopes to inspire and show that the new divide will only become reality if we let it. There is enough to do in our common Future that warrants maintaining close ties.

2 THE INSTITUTE OF ARCHAEOLOGISTS OF IRELAND AND THE PERCEIVED CONSEQUENCES OF BREXIT TO ARCHAEOLOGISTS WORKING ON THE ISLAND OF IRELAND

Author(s): Sullivan, Eoin - Elder, Stuart - Kyle, James - Ryan, Chelsea (Institute of Archaeologists of Ireland)

Presentation Format: Oral

The paper will outline the mission and function of the Institute of Archaeologists of Ireland as per its Three Year Strategic Plan. The Membership base of IAI, has as one of its greatest strength, diversity of Members in all sectors of the profession across two legislative jurisdictions on the island of Ireland.

The political border on the island of Ireland for the last twenty years has been crossed effortlessly by archaeologists in a two-way flow of those seeking employment in the profession and delivering tendered contracts. This was a significant factor in the successful delivery of development projects in the Republic of Ireland in the 1990's up to the mid 2000's. As the Republic of Ireland reaches closer to full employment and a forecast increasing demand for archaeologists, we have IAI Members whose project load covers the Republic of Ireland, Northern Ireland and Britain. The uncertainty of movement and employment caused by Brexit will unfold over time and will be tracked in this paper.

But the flows for the archaeological profession do not solely reflect archaeological personnel, it is also the flow of archaeological material, where under export licencing legislation, some samples are sent to Northern Ireland and Britain for processing. A new regulatory mechanism raises practical and financial concerns for the archaeological profession.

A large cohort of our Members are employed in research and teaching in the University sector. Funding for partnered research projects at an EU level is uncertain at the time of writing this submission.

3 RUNNING BACK THE BREXIT CLOCK: NEW PERSPECTIVES AHEAD FOR INTERNATIONAL COLLABORATIONS?

Author(s): Schlanger, Nathan (Ecole nationale des chartes, Paris; UMR Trajectoires, Nanterre)

Presentation Format: Oral

Archaeology has long been recognised as a Janus-faced discipline, at once "eminently national" and also resolutely international, and indeed transnational. These combined characteristics have transpired time and again in historical contexts, be it regarding the archaeological exploration of the Mediterranean cradle of European civilisation, the exhumation and translocations of the monuments of the ancient Orient, or the "opening up" of colonial lands for human origins research. Throughout these and other episodes, all the way to the 21 century, the fault-lines and centres of gravity have been relatively well know.

This historical perspective, as briefly presented in this paper, provides one possible backdrop for making sense of the eventual configurations to emerge since June 2016 out of the UK self-inflicted Brexit (with all the caveats of uncertainty). Regardless of strong personal and intellectual affinities, prospects for collaborations on matters of organisation and funding, as well as research, public outreach and heritage management, will all have to be reconsidered and negotiated.

Even if by default, even if with bemusement and bitterness, this necessity for reconsidering and reconstructing new forms of relationships can bring forward some new ideas and perspectives – we should look out for that perspective, and then use the invigorating forum of the EAA for promoting international collaboration across the continent and globally.

4 BREXIT – SO NOW WHAT ARE WE GOING TO DO?

Author(s): Hinton, Peter (Chartered Institute for Archaeologists)

Presentation Format: Oral

This paper, like the UK parliament, is divided on Brexit.

Half of the presentation will be from ClfA, presenting its most recent analysis of the potential impacts of what has happened, and what ClfA has been doing to mitigate the damage that might be done and to capitalise on the few potential opportunities. Concerns relate to changes of UK legislation affecting archaeology and the ability of European archaeologists to work across the EU/UK border.

Half of it will be personal, reflecting on how we got here, and what we, as individuals and European organisations could do about it. And what we should do about it. And – if discussion goes well – we might even decide what we will do about it.

So a paper of two halves: one seeks to be reasoned, informed and moderate; the other will be illogical, unfounded and emotional. That seems to be the pattern for this issue.

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Stapfer, Regine (Institute of Archaeological Sciences, University of Bern; Archäologischer Dienst des Kantons Bern) - Brandl, Michael (Austrian Academy of Sciences, OREA-Institut, Raw Material Lab) - Hinz, Martin - Heitz, Caroline (Institute of Archaeological Sciences, University of Bern)

Format: Regular session

In addition to the established laboratory methods, pXRF has experienced a real boom in archaeology in recent years. Due to further development of instrument technology and miniaturisation of the devices, today it is possible to conduct analyses directly in situ in the field or in archaeological collections. On one hand, the fast and cost-effective measurements also allow the processing of large series of objects, which enables statistical evaluation. On the other hand, non-destructive pXRF analyses can also be used to sample outstanding and thus particularly meaningful cultural objects that need to be undamaged for the future.

While pXRF is well established in some areas - e.g. for provenancing obsidian or volcanic rock as well as metallurgical analysis - the method is less common regarding other artefact categories. While also considering the significant variation in the analytical performance of pXRF compared to highly sensitive laboratory methods for different materials, this session will specifically focus on the potential of analytical data obtained by this method to reconstruct the past.

We invite speakers to present the applications of pXRF in archaeology, in particular for raw material analysis and provenancing, which are embedded in further considerations of manufacturing and socio-historical aspects.

- What do different concentrations of elements mean with regard to the mobility of objects and people?
- In which circumstances can we speak of “foreign objects”?
- How can different raw materials be incorporated into stylistic differences that we can conceive archaeologically?
- Which models of social and cultural anthropology are suitable to better understand the use of foreign raw materials?
- Can general trends – e.g. of raw material preferences, “trade routes” etc. – be identified?

With this session we aim to highlight the high potential of pXRF as an intrinsic archaeological research tool in the context of interpretative assessment and to open up new perspectives.

ABSTRACTS

1 INTRODUCTION: POTENTIAL AND LIMITS OF PORTABLE-ED-XRF TO INVESTIGATE SPATIAL MOBILITY IN NEOLITHIC SOCIETIES

Author(s): Stapfer, Regine (University of Bern, Institute of Archaeological Sciences, Prehistory; Archäologischer Dienst des Kantons Bern) - Heitz, Caroline (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research) - Hinz, Martin (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research) - Thierrin-Michael, Gisela (University of Fribourg, Department of Geosciences, Archaeometry Group; University of Bern, Institute of Archaeological Sciences, Prehistory) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research)

Presentation Format: Oral

In order to better understand mobility patterns in Neolithic societies of the Northern Alpine Foreland pottery of simultaneous lake dwelling settlements was studied by combining stylistic analyses with characterisations of the potter’s clay used.

To characterise the ceramics different methods were combined: macroscopic grouping, chemical analysis by portable ed-XRF as well as petrographic on thin sections and mineralogical analysis by X-ray diffractometry (XRD). The latter supported the interpretation of the chemical results.

Since studies on the use of pXRF to investigate handmade, heterogeneous and coarsely tempered ceramics are rare so far, the usefulness of pXRF to characterise this kind of pottery has been evaluated. In order to obtain quantitative, meaningful results, an analysis strategy was developed in which both the effort and the results are in good proportion to each other. Additionally, a sample of the ceramics analysed with pXRF was checked with laboratory wavelength dispersive X-ray fluorescence (WD-XRF).

The comparison of pottery deriving from settlements of different locations shows the potential information that can be gained from a combination of pXRF and stylistic analyses to identify mobility patterns in Neolithic societies.

The limitations to pXRF analyses in the area under study are shown when attempting to differentiate between potter’s clays from regions with similar geological conditions to study small-scale mobility: This pottery can only tentatively be distinguished. A comparison between pXRF and laboratory WD-XRF data shows that in this case the poor distinction is less method-related but, rather, caused by the very similar geological conditions and materials available.

- 2 THE RECONSTRUCTION OF NEOLITHIC CERAMICS – MULTI-SCALE MEASUREMENT ANALYSIS FROM P-ED-XRF SIGNATURES VIA X-RAY FLUORESCENCE ANALYSIS TO X-RAY MICROTOMOGRAPHY SCANS**
Author(s): Menne, Julia (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-University of Kiel) - Heilmann, Christopher - Holzheid, Astrid (Institute of Geosciences - Experimental and Theoretical Petrology, Christian-Albrechts-University Kiel)
Presentation Format: Oral
- It is assumed that the p-ed-XRF measurements provide sufficient and accurate results. The investigation of ancient pottery with regard to their material composites allows insights into the material structures, production techniques and manufacturing processes. For this reason, additionally to conventional microscopic examination and petrographic thin sections, multi-element analyses of portable ed-XRF (p-ed-XRF) have become more and more important for archaeological research questions. As a result, the number of ceramic studies using this method has increased enormously in recent years.
- In this paper, a comparison of the different methods is made to evaluate the methodological limitations and the comparability of these ceramic analysis. We want to investigate the measurement accuracy and compare the quantitative measurements of a portable Niton XL3t900-ed-XRF-device to the conventional quantitative data from a wavelength XRF device (w-d-XRF) to determine the limits of precision. In addition, material structures using x-ray microtomography scans (μ -CT) were studied, which made it possible to extract the temper components and the related porosity non-destructively. The aim of this study is to investigate the methodological relationship between the various established methods of ceramic analysis in order to evaluate the quality of these measurement techniques for a precise comparison of their reliability and applicability. In our opinion, this approach offers the possibility to verify and extend the proven methods and to open up new fields of application.
- As a case study, the elemental contents of the ceramics of megalithic tombs were measured. The used samples derive from megalithic tombs of the Funnelbeaker Westgroup in northwestern Germany. For the first time, a comprehensive methodological investigation of the geochemical analyses and their limits can be carried out on this Neolithic ceramic.
- 3 PORTABLE X-RAY FLUORESCENCE ANALYSIS (P-ED-XRF) OF SOURCING AND PRODUCTION SERIES OF THE IRON AGE CERAMICS FROM BASEL-GASFABRIK (CH)**
Author(s): Gottardi, Corina - Wimmer, Johannes (University of Bern)
Presentation Format: Oral
- Basel-Gasfabrik is a Late Iron Age settlement (2nd/1st century BC) on the banks of the river Rhine. A large part of the 15 ha settlement was excavated over several decades, resulting in an extensive body of ceramics. As part of the research project "Über den Grubenrand geschaut" (Thinking outside the pits) some of these ceramics were analyzed using both portable X-Ray Fluorescence Analysis (p-ED-XRF) as well as typological methods.
- In addition to tackling methodological questions concerning sample preparation, precision of the instrument and possible contamination through soil bedding, the main focus is the geochemical characterization of the settlement ceramics of Basel-Gasfabrik. Combining the geochemical results with already available micromorphological data and previously prepared macroscopic sample descriptions (grouping) ensures a substantiated interdisciplinary approach. Whereas for the wheel-thrown fine ceramics, the focus lies on the differentiation of local production series, of main interest for the coarse pottery is the provenance of typologically striking vessels. Some of them show macroscopically discernable tempering with muscovite and crushed fossils, that don't occur naturally in the area surrounding the settlement.
- Contrary to expectations, it appears that in the late Iron Age handmade coarse pottery is a lot more mobile than fine ceramics. The coarse ware, which may have served to transport preserved food, traces a (supra-) regional trade system whose significance is often forgotten next to Mediterranean imports (amphorae, tableware).
- 4 CHEMISTRY IN THE PALM OF YOUR HAND, AND CERTAINTY IN SIX MINUTES?**
Author(s): Gerber, Yvonne (Universitaet Basel, Departement Altertumswissenschaften)
Presentation Format: Oral
- With a long practice of stationary XRF (Geochemical Laboratory, University of Basel, Switzerland; under the direction of Prof. W.B. Stern), the author had the opportunity to undertake a chemical provenance study via pXRF and to compare it with results obtained on two stationary ED-XRF systems.
- Two questions are asked, and tentatively answered: is pXRF currently up to the task as specified, and how does it perform compared to older, stationary systems?
- Samples analysed were :
- Nabataean fine and common ware from the Nabatean capital, Petra (Jordan) (Swiss-Liechtenstein excavations at the habitation quarters on az-Zantur, Petra; University of Basel, Switzerland).
 - Nabataean fine ware samples found in the Nabatean border settlement Hegra (Saudi Arabia), distant some 500 km from Petra (French-Saudi excavations in Hegra; CNRS – Orient et Méditerranée; University of Paris 1, France; and University of Hâ'il, Saudi Arabia).
- The author worked as ceramologist on both excavations. The samples from Petra are known to be produced locally. For the Hegra

samples, the question was: local or imported? A preliminary provenance hypothesis based on typology was tested.

Petra samples had been previously analysed by the author on two different ED-XRF systems. Those measurements served as reference. They were analysed again, in pXRF, together with the Hegra samples. A statistical analysis of the resulting chemical classification and its typo-chronological correspondence is presented. A-priori and a-posteriori attributions are confronted. Reproducibility, accuracy, precision and practicality of current pXRF for this kind of analysis are critically assessed.

5 SOCIAL ASPECT OF POTTERY PROVENANCE IN ASSEMBLAGES FROM THE ROKŠTEJN CASTLE AND ITS PRIMARY FIEFDOM

Author(s): Mazackova, Jana - Žaža, Petr - Vaněčková, Daniela (Masaryk University)

Presentation Format: Oral

The Rokštejn Castle pottery assemblages span from the 13th to the 15th century, encompassing the existence of the Castle from its origins until the destruction in 1467. Based on the data from the systematic archaeological excavation of the Castle. The main parts pottery is of the inner castle moat, and stratified pottery assemblages are precisely dated. Pottery assemblages for comparison come from settlements of the primary hinterland (castle fiefdom) and are approximately 75 years older than from the castle itself. The samples also cover Early Modern Period pottery (excavation at Panská Lhota No. 31). The aim of this presentation is to discuss the development of pottery in the castle and village environments as a social aspect of local production and/or trade with pottery. The study of the provenance of the pottery (pXRF and macroscopic analyses) is an ongoing project focused mainly on the area of the Bohemian-Moravian Highlands, where the castle and its hinterland are situated.

6 DECEPTIVE COLOURS - AN X-RAY CASE STUDY

Author(s): Gfeller, Frank (Free Researcher)

Presentation Format: Oral

To examine the unusual findings of yellow Roman tiles in several archeological sites close to Zürich, the responsible archeological department initiated a pXRF based provenance research. The point in question was whether the yellow tiles show the same elemental pattern, if they might share the same origin, and how they differ from red tiles found in the same contexts. Moreover, reference material taken from the clay-mortar of a Roman kiln in Wettswil-Josenmatten should show if the source of the yellow tiles was close to Wettswil. Although the questions addressed above seem perfectly tailored for a pXRF-study the results were highly ambiguous and none of the issues could be solved without leaving doubts. However, subsequent experiments, including re-burning of sample material and X-Ray diffraction (XRD), led to additional insights and a better understanding of the XRF-Data. Based on the mineralogical phase composition we were able to explain the question of the yellow colour, to determine the approximate burning temperature and to infer why yellow Roman tiles are rare in this region.

As a consequence we would like to emphasize the benefit of a combined XRF/XRD study and to discuss what additional information we can obtain from ceramic material.

7 TWELVE YEARS OF PXRF ANALYSES ON MEDITERRANEAN OBSIDIAN AND CERAMICS: COMPARING SOURCE IDENTIFICATION AND FOREIGN TRADE INTERPRETATION BETWEEN THESE MATERIALS

Author(s): Tykot, Robert (University of South Florida)

Presentation Format: Oral

Sourcing artifacts of obsidian, a volcanic and homogeneous lithic material which comes from a limited number of potential sources, has been successful since the 1970s using analytical instruments including X-ray fluorescence and neutron activation analysis, and since the late 1980s laser ablation ICP mass spectrometry. Starting in the mid-2000s, the ability to conduct nondestructive analyses within museums using portable XRF instruments has revolutionized the number of obsidian artifacts tested and produced large statistically significant datasets allowing comparisons in trade and distribution between sites and regions and over time.

Pottery production and trade studies using these three analytical instruments goes back many decades, while the number of artifacts in analytical studies has increased tremendously with the widespread availability of portable XRF spectrometers. Nevertheless, the existence of clay deposits over great distances along rivers, and the compositional alteration in ceramic production due to adding temper, potentially mixing clays, and having burnished, slipped, or glazed surfaces has always limited the precision of geological source attribution and socioeconomic distribution and trade interpretation, especially when nondestructive surface analyses are conducted.

Over the past 12 years, more than 17,000 obsidian and ceramic artifacts were analyzed using three models of a portable XRF spectrometer that developed over that time. While the increased number of measurable elements and better detection limits of the most recent versions of pXRFs has not made a big impact on obsidian sourcing studies, it clearly has for pottery analyses. Obtaining results while using a vacuum on all of the major elements, and on more trace elements than before with detection limits in single digit ppm, can definitely indicate when ceramic artifacts are non-local, and the use of appropriate calibration software enables comparison with published data for other sites and regions. Examples from studies in the central Mediterranean will be presented.

8 COMPARISON OF RAW MATERIAL DETERMINATIONS WITH pXRF AND MICROFACIES METHODS

Author(s): Wehren, Helena (University of Bern, Institute of Archaeological Sciences) - Affolter, Jehanne (Ar-Geo-Lab) - Hinz, Martin (University of Bern, Institute of Archaeological Sciences)

Presentation Format: Oral

“In this presentation the microfacies and pXRF analyses for the identification of silicite sources of archeological artefacts are compared. Microfacies analyses is a proved nondestructive geological method. pXRF is as completely non-destructive alternative for investigation of the fingerprint of archeologic artefacts and could be used for linking the artefact found in an archeologic site to the outcrop where it was gathered.

The main issues that are addressed by the ongoing research are: Is pXRF a valid investigation method for silicites? Does the very high Silicium content hinder the detection of elements which are present in low concentrations? Are the inhomogeneities within the same piece smaller than between pieces of different origin? Can the measuring mode or protocol be improved?

The archaeological artefacts analysed, stem of dryland sites from the Mesolithic to the Neolithic time in western Ukraine and of a Neolithic wetland site in Switzerland. Because of the environmental difference in the storage conditions of the artefacts we can furthermore test if the applicability of the pXRF method is depending on environmental conditions of archaeological sites.”

9 VARISCITE PROVENANCE ANALYSIS. A REVIEW

Author(s): Odriozola, Carlos (Universidad de Sevilla) - Villalobos García, Rodrigo (Universidad de Valladolid) - Edo i Benaiges, Manuel (CIPAG) - Martínez-Blanes, José María (CSIC; Universidad de Sevilla) - Garrido-Cordero, José Ángel (Universidad de Sevilla)

Presentation Format: Oral

A major research question in the study of prehistoric Europe is the analysis of traded items - for example, amber, variscite, ivory ... - and their implications for understanding social interaction dynamics. Exchange theories developed since the mid 1970's have been successful in developing this avenue of research. Rare minerals as variscite offer an excellent opportunity to study trade and exchange patterns in prehistoric Europe.

Green beads exchange has been for long understood as a key feature of long distance exchange. Recent studies have point to some key elements or element ratios as the clue to define exchange flows. In this communication, we review all the approaches to variscite provenance cross validating them with a dataset of c. 500 XRD, portable XRF and NMR analysis of the 4 Iberian known outcrops and green bead's assemblages coming from 10 sites coeval to the mines exploitation. We specially focus on the use of portable XRF devices.

This opens pathways to think about how production and consumption is organized in a global scale, as in the case of jade, 'imitations' or more 'mundane' raw materials are being used near production areas and the more valued material is being long distance traded. To this particular is very interesting to think about the role of the communities that mined, transformes and traded this valued raw materials.

10 XRF AS A TOOL FOR HISTORICAL MODEL-BUILDING: THE CASE STUDY OF ANCIENT KHOREZMIAN METALWORKING

Author(s): Ruzanova, Svetlana (State Historical Museum)

Presentation Format: Oral

Today XRF analyses are widely used for the determination of the base elemental composition of ancient metals and alloys. Nevertheless, each archaeological collection creates a unique context for the interpretation of the obtained analytical data. This paper presents the first characterization of non-ferrous metalworking in ancient Khorezm (Chorasmia). The study is based on the compositional analysis by X-ray fluorescence (including pXRF) of a large series of metal objects from Khorezm, a river oasis region in the Amu Darya delta in western Central Asia (modern Uzbekistan). The metal artefacts analyzed date from the 7th century BC to the 5th century AD. Because there are no metal ore deposits in this region, all raw materials had to be imported. The obtained analytical data show a very wide and disparate range of metals and alloys used in Khorezmian workshops which suggest a variety of sources of raw materials. Combining an analytical study of the data with the archaeological evidence provides new insights into metal production in the Khorezmian oasis, and into the trade in metals in a wider Central Asian context.

11 PORTABLE XRF ON PREHISTORIC BRONZE ARTEFACTS: LIMITATIONS AND USE FOR THE DETECTION OF BRONZE AGE METAL WORKSHOPS

Author(s): Noergaard, Heide (Aarhus University, Dep. Culture and Society)

Presentation Format: Oral

Bronze Age metal workshops are identifiable through mistakes and traces of the crafting process on metal artefacts (Nørgaard 2018). During a study on bronze artefacts of the Nordic Bronze Age, the question arose if these workshops are also unique in their metal -the trace elemental composition of the artefacts -as the theoretical assumption of a technical fingerprint suggests. A case study tested scientific devices that can be used to collect data for such a study - EDXRF, SEM and pXRF. The investigated material are bronze artefacts of defined workshops between 1500-1100 BC in Denmark and northern Germany. In this presentation, the results of three analytical methods are compared, and the limitations of every method are demonstrated.

In order to investigate the use of portable XRF technologies for the detection of crafting-related differences in the alloys, an experiment was conducted on corroded bronze artefacts. Two different scientific analyses—one destructive (sampling and SEM) and one non-destructive (pXRF)—were carried out on two artefact assemblages each related to a specific technological tradition (workshops). Results documented on the thin-sections of the first artefact group highlight a distinct change measured within the elemental composition from the bulk metal to the surface in the corrosion crust of the copper-tin alloy. These documented changes greatly influenced the interpretation of the data obtained by the pXRF. A third artefact assemblage consisting of artefacts of a distinct workshop on Zealand was analysed via EDXRF by using drilled samples. The results obtained here clearly show the assumed similarities in metal use.

This study defines the possibilities and limits of non-destructive analytical techniques using a specific example. The elemental changes that can occur on the surface of corroded bronze ornaments change the element composition in such a manner that the original alloy cannot be traced via a non-destructive pXRF method.

12 A CRITICAL NOTE ON PROVENANCE STUDIES IN ARCHAEOLOGY

Author(s): Brandl, Michael (Austrian Academy of Sciences, OREA-Institute, Vienna) - Martinez, Maria (Smithsonian Institution, National Museum of the American Indian - NMAI, Washington DC; The University of Texas at Austin, Department of Anthropology)

Presentation Format: Oral

The booming application of pXRF for analyzing archaeological materials calls for a critical review of the potentials and risks of a method, which may appear as a panacea considering the plethora of scientific contributions celebrating its successful implementation. This is mainly due to its non-destructive nature and relatively easy handling of the XRF gun. Examples include material determinations in the context of fieldwork and museum based research, e.g. conservation science and its value in the repatriation process, of soils, mineral pigments, heavy metals, ceramics, rocks, and metals. For this type of analyses, pXRF is well established.

A more critical application however concerns provenance studies. Although capable to obtain elemental data for geochemical analyses, the suitability of this analytical tool highly depends on the material analyzed. Since the use of pXRF for lithic provenance studies constitutes an especially challenging issue, this contribution will examine its application from this perspective. As such, we will present case studies which demonstrate limitations as well as well-grounded future prospects of pXRF in archaeometry.

13 HIGH-RESOLUTION GEOCHEMICAL EVIDENCE FOR THE USE OF INDOOR SPACE IN VIKING-AGE RIBE, DENMARK, USING A HANDHELD XRF

Author(s): Trant, Pernille - Kristiansen, Søren (Department of Geoscience, Aarhus University; Centre for Urban Network Evolutions, Aarhus University) - Wouters, Barbora - Sindbæk, Søren (Centre for Urban Network Evolutions, Aarhus University)

Presentation Format: Oral

Faster and cheaper methods allow us to increase the amount of samples from archaeological excavations and materials which can be processed in a cost-efficient way. Here, we present the use of a handheld (x-ray fluorescence) pXRF for the laboratory analysis of bulk sediment samples from an activity layer excavated inside a 9th-century CE market place house in the emporium of Ribe, Denmark.

The house was sampled during the Northern Emporium Project excavation (2017-2018) in a closely spaced grid of 0.25 x 0.25 m (a total of 1108 samples), which allowed us to sample approximately half of the surface area of the house. This high-resolution sampling strategy poses an opportunity to obtain a better understanding of the use of indoor space at this early point of urbanism in the Viking world.

A high spatial resolution data set such as the one created here makes it possible to 1) include a thorough statistical analysis on the use of pXRF for this type of study, 2) examine how more traditional, coarser sample spacing can influence interpretations, and 3) potentially create better archaeological evidence of different activity areas within this house when combined with the excavation results and other scientific analyses. In this paper we will present the first results and on this basis discuss new methodological considerations for sampling soils from archaeological settlement contexts.

14 EVERYTHING GOES BACK TO DUST: PXRF AS A TOOL TO INVESTIGATE SPACE FUNCTION AND ORGANISATION

Author(s): Save, Sabrina (Amélie SARL)

Presentation Format: Oral

As well stated in this session resume, pXRF has experienced a recent boom in archaeology in the past decades, its most common and established use being provenancing obsidian and volcanic rocks. While the use of pXRF is still struggling to assert itself in the study of other types of artefacts, facing a mix of methodological and ideological battles, pXRF should not be restricted to the analysis of artefacts only.

Geochemical surveys and soil analysis have been developed in archaeology since several decades to investigate space function and site organisation. Different analytical methods are currently in use: phosphate concentration, ICP-OES, ICP-MS, XRF and

pXRF. Except for pXRF and the in-field method to measure phosphate concentration, all techniques require expensive lab-based equipments and/or time-consuming processing and preparation of samples. The constant improvement in precision and accuracy of the equipment, and the rapidity and cost-effectiveness of the measurements make pXRF a serious challenger to lab-based equipment and an ideal method for Developer-funded Archaeology.

The efficiency and relevance of geochemical surveys is no more to prove. Often used in combination with other proxies like geophysics and micromorphology, it provides an inequivalent insight of microscopic soil pollution generated by past human activities and thus can explain or confirm the function of features and spaces.

In the aim to develop further geochemical surveys and make them available in terms of budget and time-frame to the global archaeological community, we developed a new method to survey extensive archaeological surfaces with pXRF to investigate, at both large and local scale, human impact on soil chemistry. In this paper, we will present examples of studies we have undertaken in various contexts to illustrate the potential of pXRF in the investigation of space function and organisation, and discuss the perspectives of its development in the near future.

A. P-XRF MEASUREMENTS AND ARCHAEOLOGICAL PIGMENTS

Author(s): Affolter, Jeanne (Ar-Geo-Lab, Neuchâtel)

Presentation Format: Poster

The pigments found in archaeological sites consist mainly of iron derivatives or compounds for yellow, red or brown colours, of coal for black and grey colours and of chalk for white colours. We shall limit ourselves here to the first category, whose components react better to X-ray fluorescence spectrometry analyses. This type of analysis, common in geology, is still not widely applied for the study of ochre in archaeology (Hodgkiss et Wadley 2017). This may be due to the fact that a powder is usually made of the sample to be analysed before it is measured. The arrival of portable measuring devices (p-xrf), which allow the sample to be measured directly on its surface, makes it possible to remedy this situation and therefore seems very promising for archaeology.

In order to identify the potential applications of this device for pigment studies, a series of archaeological samples from Swiss Young Palaeolithic sites were analysed simultaneously with a batch of samples corresponding to the potential sources of these archaeological finds based on macroscopic and stereomicroscopic examination. The results will be presented and discussed during this communication, in order to define the possible journey of the ochre parallel to the known flint routes.

B. NEOLITHIC SILICEOUS TOOLS FROM LIMBA-OARDA DE JOS (ALBA COUNTY, ROMANIA): NEW ARCHAEO-METRIC RESULTS

Author(s): Rey, Mar (Babes-Bolyai University, Department of Geology) - Ionescu, Corina (Babes-Bolyai University, Department of Geology; Kazan Federal University, Archeotechnologies & Archeological Material Sciences Lab) - Ciută, Marius-Mihai (Lucian Blaga University) - Muresan-Pop, Marieta - Simon, Viorica (Babeş-Bolyai University, Faculty of Physics, Interdisciplinary Research Institute on Bio- Nano-Sciences) - Barbu-Tudoran, Lucian (Department of Biology, Babeş-Bolyai University Cluj-Napoca)

Presentation Format: Poster

Limba - Oarda de Jos (Alba County in Transylvania, Romania) is an archaeological site dated between 5,405 and 5,310 cal BC. More than 20 years of active research have endowed it as a key-site in understanding the complexity of the Neolithic processes from this part of the Intra-Carpathian area. The extensive collection of archaeological artefacts is actually stored at the 'Ion Răica' Municipal Museum in Sebeş. The lithic industry is dated in early Vinča culture period (Vinča A and Vinča B1) and was knapped from different kind of stones.

The present archaeometric study regards a set of lithic industry set consisting of 322 siliceous pieces (tools and débitage) from which 20 pieces have been analysed by polarized light optical microscopy (OM), 22 by Fourier-transform infrared spectroscopy (FTIR) and 28 pieces by cold field emission scanning electron microscopy coupled with energy dispersive X-ray spectroscopy (CFE-SEM-EDX). The aim of the study is to characterize and classify the objects based on compositional and microstructural features, and finally to infer the provenance of the raw materials. Several petrographic types have been discriminated, including: a) radiolarites, b) cherts, c) fossiliferous cherts and d) siliceous limestones.

All samples analysed show FTIR bands which can be assigned to Si-O vibrations in quartz. The samples made of fossiliferous chert and siliceous limestones have an additional wide band produced by carbonates. CE-SEM-EDX shows specific microtextural and compositional characteristics which might be used as "fingerprints" for each group of samples.

These results support the classification of the lithic tools according to the mineralogical and petrographic composition and may be further used for tracing the sources of the rocks and to better understand human behaviour in primitive environment. Acknowledgement. M. R.-S. acknowledges the support of the Romanian Ministry of Research and Innovation, through UEFISCDI/CNCSIS project PN-III-P1-1.1-PD-2016-0859.

C. LEATHER DEGRADATION: AN EXPERIMENTAL APPROACH USING PXRF

Author(s): Halldórsdóttir, Hrafnhildur - Taylor, Gillian (Teesside University)

Presentation Format: Poster

Archaeological leather from wet soil environments is commonly contaminated with inorganic particles from the burial medium,

such as iron and silica. Once excavated, these inclusions can contribute to ongoing degradation of the leather through oxidation, posing problems for conservators working to stabilise the artefacts. Furthermore, soil inclusions complicate the identification of pigments and dye in leather using approaches such as pXRF, as separating endogenous from exogenous inorganic chemicals becomes increasingly difficult. Especially as little is known about the processes and nature of soil leaching into leather artefacts and its effects collagen and dye preservation. This investigation explores the inorganic elemental concentrations in soil and leather samples from experimental burials. The leather samples were dyed using oil, madder and vinegar, and buried under different soil conditions for eight months. The samples were excavated at a two month interval and analysed using a portable X-Ray Fluorescence detector (pXRF) and a Fourier-Transform Infrared Spectrometer (FTIR). The pXRF elemental concentrations of the leather samples were compared to those of the soil, in an attempt to follow the process of soil and dye interactions. Further, they were compared to FTIR spectra of the leather amide bonds, to inspect whether a relationship may exist between the presence of specific inorganic chemicals in buried leather and collagen degradation.

238 FUNCTIONAL ANALYSES OF HUNTER-GATHERER LITHIC TOOL ASSEMBLAGES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux) - Chu, Wei (University of Cologne) - Marreiros, João (RGZM Archaeological Research Institute)

Format: Regular session

Lithic artefacts are a principal source of information for reconstructing the cultural traditions, movement, behaviours and diets of Palaeolithic and Mesolithic people. While it is generally assumed that these artefacts were designed and used to carry out a wide range of specific tasks, in most cases we know little about the precise past functions of individual artefacts or artefact types.

Our current poor understanding of the function of many tool types means that the epistemological challenge laid down decades ago by the influential calls for the development of middle-range theory (Binford 1962) remains largely unanswered. It also poses stumbling blocks for archaeological practice more widely, as a lack of understanding of artefact function stymies attempts to create robust artefact typologies, with consequent problems for the construction of cultural taxonomies.

Nevertheless, piecemeal progress continues to be made in understanding archaeological artefact functions. New research methodologies and studies have generated unexpected results that have broadened our understanding of prehistoric subsistence strategies, technological habits and lithic material use.

The aim of this session is to review current understandings and outstanding questions concerning archaeological and interdisciplinary approaches to identifying lithic tool use by past hunter-gatherer societies, including use-wear quantification and residue characterisation, experimental approaches and ethnoarchaeological studies. We invite papers focusing on methodological and interpretive questions and innovations, ideally supplemented with case studies expressing an engagement with questions of broad archaeological significance. We also welcome papers based on work by, collaborations with and ethnographies of contemporary and historical hunter-gatherer communities and their members. We intend the eventual publication of papers from this session as a special journal issue or collection.

ABSTRACTS

1 TRACEOLOGY 2.0: DEVELOPING EXPERIMENTAL PROGRAMS COMBINING MATERIAL PROPERTIES, VARIABLE CONTROL AND USE-WEAR QUANTIFICATION

Author(s): Marreiros, Joao (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; ICArEHB, Interdisciplinary Center for Archaeology and Evolution Human Behaviour, University of Algarve; Institute for Prehistoric and Protohistoric Archaeology, Johannes Gutenberg University) - Calandra, Ivan - Gneisinger, Walter - Pedergnana, Antonella (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Schunk, Lisa (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; Institute for Prehistoric and Protohistoric Archaeology, Johannes Gutenberg University) - Paixao, Eduardo (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; ICArEHB, Interdisciplinary Center for Archaeology and Evolution Human Behaviour, University of Algarve)

Presentation Format: Oral

Investigating how artifacts were produced and used by past Humans is a key research area in the study of human behavioral evolution. Use-wear analysis, as part of functional studies, has the clear potential to significantly contribute.

Common approaches within archaeological traceological studies harness life-like experimentation, which changes the sample surfaces through use, followed by comparison with wear-patterns on archaeological artifacts. In recent years, controlled experiments and methods to quantify use-wear have been developed and increasingly applied to address these issues. However, researchers are still debating how the coexistence of multiple variables in actualistic experiments makes quantification, com-

parison and interpretation of the results challenging. The present discussion aims to improve on standardization, repeatability and reproducibility during experiments and analyses.

Following this approach, from our perspective, experimental planning in traceological studies should rely on four main aspects: 1) material properties, 2) experimental design, 3) sample preparation, and 4) experiments under controlled conditions.

In this talk, we present our research on use-wear formation that can be used to interpret tool use from the archaeological record. Driven by questions raised from archaeological research, our talk will be focused on this research workflow, illustrated by case studies on understanding stone tool selection, production, use, durability and efficiency. Using standard stone tools, where edge angles and morphology are controlled, here different types of raw materials will be used and tested on cutting and scraping movements. Edge durability and tool efficiency will be measured and compared against the different variables.

Here we also aim to disseminate standards and protocols on traceological experiments recently developed in the Laboratory for Traceology and Controlled Experiments at MONREPOS, allowing repeatable and reproducible research and comparison between researchers and laboratories focusing on use-wear.

2 THE EFFECT OF PATINATION ON THE PRESERVATION OF USE-WEAR TRACES: PRELIMINARY EXPERIMENTAL OBSERVATIONS

Author(s): Halbrucker, Éva (Department of Archaeology, Ghent University) - Fiers, Géraldine (Pore-scale Processes in Geomaterials Research Group - PProGResS/UGCT, Department of Geology, Ghent University) - Messiaen, Liesbeth - Vandendriessche, Hans (Department of Archaeology, Ghent University) - De Kock, Tim - Cnudde, Veerle (Pore-scale Processes in Geomaterials Research Group - PProGResS/UGCT, Department of Geology, Ghent University) - Crombé, Philippe (Department of Archaeology, Ghent University)

Presentation Format: Oral

While use-wear analysis has become a standard method to identify tool functions in the past, an important challenge this approach still faces resides in the assessment of the effect of post-depositional alterations on the preservation of use-wear. In the case of Palaeolithic and Mesolithic stone tools, one of the most present alteration types is patination. Patination can take on a multitude of forms and colours and can, for example, be glossy, white, or blueish. They all refer to different kinds of chemical and structural changes occurring in the raw material.

In the research practice, patinated pieces are often discarded from the use-wear analysis, which might cause a research bias in interpreting tool-kits and activities. This problem is recognised by many other research groups as lately, an increasing number of projects focuses on similar research questions (Caux et al., 2018, Glauberman and Thorson, 2012, Burrioni et al., 2002).

On the lithic artefacts, dating to the Final Palaeolithic and Mesolithic, within our research area, the Scheldt Basin (BE), we predominantly encounter white or blueish patinas and less frequently glossy patination. Two methods are currently being tested to reproduce these patinas, one in an alkaline environment and one in an acidic environment. Tool replicas of different types of raw materials were used in various experiments mimicking prehistoric activities. These tools were then either put in a warm sodium hydroxide solution (alkaline environment) or buried in soil and regularly watered with a lactic acid solution (acidic environment). The two methods differ in many ways, i.e. aggressiveness and time duration of the experiment. Therefore, their effect on the use-wear traces is also expected to differ. In this presentation, the first results of their impact on the preservation of experimentally produced use-wear traces will be compared and linked to the archaeological patinas.

3 RESULT OF CARRYING OR PUTTING INTO A SHEATH? NEW DATA CONCERNING TRACES RESULTING FROM TRANSPORTATION, HAFTING AND SECURING OF FLINTS

Author(s): Osipowicz, Grzegorz - Orłowska, Justyna (Nicolaus Copernicus University/ Institute of Archaeology)

Presentation Format: Oral

Microscopic research on the characteristics of use-wear traces forming on flint artefacts as a result of their use is one of the basic objectives of the traceological analysis. For some time, the attention of researchers has been attracted not only by the wear traces visible at the working edges of tools, but also the ones visible in their other parts. These traces can be the result of the tool's contact with the haft, its transportation in containers or, for example inserting them into the sheaths.

In our presentation we present results of experimental and traceological studies aiming to clarify the characteristics of the mentioned type of wear traces. The conducted experiments consisted of three stages. The first was based on carrying on the flint products in organic containers made of hide, wood and bone by the time of several months. The second stage of work was aimed at replicating as many types of hafting traces as possible. For this purpose, a series of experiments involving a varied use of flint tools, hafted in a different kinds of organic raw materials, were carried out. The third stage of our work consisted in a long-term insertion and removal of flint tools to/from sheaths made of hide, wood and bone.

The performed experimental work led to the creation of a very varied group of wear traces, the characteristics of which in some cases deviate from the accepted standards, in others, to a large extent, supplement the current knowledge. Experimental work was verified during a comparative analysis of the Mesolithic flint collections from sites in Paliwodzizna 29 and Ludowice 6 in central Poland.

The work was funded by the scientific project from the National Science Center (NCN) in Cracow (Poland) no. 2016/23/B/HS3/00689.

- 4 ESTABLISHING THE POTENTIAL OF 3D MODELLING AND SPATIAL ANALYSIS FOR INTERPRETING WILD PLANTS PROCESSING**
Author(s): Zupancich, Andrea - Caricola, Isabella - Mutri, Giuseppina - Carra, Maria (Diet and Ancient Technology Laboratory - DANTE, Sapienza Università di Roma) - Radini, Anita (Department of Archaeology University of York) - Cristiani, Emanuela (Diet and Ancient Technology Laboratory - DANTE, Sapienza Università di Roma)
Presentation Format: Oral
- In this contribution, we discuss the scientific benefits of an experimental approach integrating 3D modeling performed through close-range photogrammetry and the use of GIS software in order to establish a methodology for interpreting the use of groundstones exploited to process different species of wild plant foods. In recent years, 3D modeling and spatial analysis have shown their scientific reliability in the study of archaeological stone tool use. By monitoring changes in surface morphometry resulting from the use of lithic tools, these two approaches have the potential to strengthen qualitative data achieved through the observation of use wear at low and high magnifications. Moreover, the geomatic analysis of tools' surfaces allows to objectively quantify patterns of surface-modifications associated to specific activities (e.g. grinding, crushing and pounding) and/or worked materials. Additionally, the combination of surface morphometry and use wear analysis has also the potential of foreseeing patterns of residue distribution over the groundstone surfaces hence providing a key aid in establishing sampling strategies applied to archaeological specimens. For this reason, our experimental protocol was also aimed to monitor the distribution of starch granules over the experimental groundstone surfaces and its variation in relation to the state of the worked material and the action performed. The results here presented constitute part of a dedicated experimental framework carried out within the ERC project HIDDEN FOODS (GA 639286) and provide one of the first experimental dataset focused on the use of groundstones for wild plant processing, and a reliable methodology for further studies related to the exploitation of stone technology and wild vegetal substances in the past.
- 5 FISHING FOR CHANGE: 10,000 YEARS OF FISHING TECHNOLOGY AT THE SITE OF JRD (UPPER JORDAN RIVER, NORTHERN ISRAEL)**
Author(s): Pedergrana, Antonella (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Cristiani, Emanuela (DANTE - Diet and Ancient Technology Laboratory, Sapienza University of Rome.) - Munro, Natalie (Department of Anthropology, University of Connecticut) - Sharon, Gonen (Department of Galilee Studies, Tel Hai College)
Presentation Format: Oral
- The long stratigraphic sequence from the site of Jordan River Dureijat (JRD) in northern Israel covers the entire span of the Levantine Epipaleolithic (EP; c. 23-11.5 KY BP). The three upper layers of the sequence belong to the Final EP Natufian culture, while Layer 4 contains a Geometric Kebaran lithic industry. The lower part of the sequence is Early EP Kebaran. Evidence for fishing activity was found in all archaeological layers. Bone fishing hooks and small limestone and basalt line weights derive from the Natufian layers, and limestone elongated cobbles were present throughout the entire sequence. The size and standardised morphology of the limestone cobbles suggest that they were collected and transported to the site over the course of thousands of years.
- Here we present a techno-functional analysis of the lithic and bone artefacts from JRD. The small line weights and fishing hooks were analysed using low and high magnification microscopes. We also studied ethnographic fishing equipment to better understand production methods and use. In addition, a sample of the limestone elongated cobbles from JRD was analysed microscopically. Preliminary results suggest that they were functioning as net sinkers.
- The analysis of the small weights and fishing hooks provide new insights into production techniques and the methods, duration and efficiency of use by the EP fishers from the site. The results support the interpretation that the archaeological layers from JRD document thousands of years of fishing as part of repeated short term visits by EP hunter-gatherers groups to the shores of the Paleo-Hula Lake.
- 6 TECHNO-FUNCTIONAL STUDY OF LATE MESOLITHIC KNAPPED INDUSTRIES OF BRITTANY: PRELIMINARY RESULTS CONCERNING MARITIME HUNTER-GATHERER TECHNOLOGICAL TRADITIONS**
Author(s): Calvo Gómez, Jorge (University of Rennes 1)
Presentation Format: Oral
- Maritime hunter-gatherer societies have been traditionally considered by archaeologists as a subset of hunter-gatherer groups specialized in the exploitation of coastal biotopes. It has been proposed that this economical specialization requires a very precise degree of technology to obtain those specific resources (Yesner, 1980; Kelly, 2007). Fishing, shellfish gathering and sailing are well documented in the archaeological record of maritime hunter-gatherer populations from the European fringe during the Holocene. However, due to the differential preservation of archaeological data, the techniques and technical traditions behind those maritime activities are not always well understood.
- The Late Mesolithic knapped industries in Brittany, also known as Tévécien, appear to provide a suitable basis to address these questions. For example, the shell-middens of Beg-er-Vil (Morbihan, France) and Beg-an-Dorchenn (Finistère, France) have delivered numerous artefacts from knapped industries, not only finished tools (such as truncated blades and bladelets, scrapers or trapezoidal bitruncations), but also a large number of unretouched products.

Through the use-wear study of very large samples of retouched and unretouched industries, combining micro and macro use-wear methodology and experimental data to understand the functionality of these lithic tools, some preliminary hypotheses can be proposed. For example, the very widespread range of activities documented in this study and the low intensity level of use of the tools provide some new clues to better understand the technical traditions of the maritime hunter-gatherers populations.

7 NEW INSIGHTS INTO THE ANCIENT ATLATL DART TECHNOLOGY OF SOUTHERN YUKON, CANADA

Author(s): Thomas, Christian (Government of Yukon)

Presentation Format: Oral

In the mountains of the Yukon, northern Canada, mountain ice patches have been melting and revealing a 9,000-year record of First Nations' hunting weapons. Included in these assemblages are dozens of lost hunting arrows and the fragmentary remains of more ancient hunting spears referred to as a throwing darts or atlatl darts. For 20 years the fragmentary remains of this locally extinct technology have been recovered from a variety of sites across southern Yukon. For the first time in the summer of 2018 a complete, and entirely intact throwing dart was recovered from the overlapping territories of the Carcross Tagish and Kwanlin Dün First Nation's. This specimen is crafted from three separate pieces of wood and features an intact stone point, sinew bindings and carefully adhered fletching. In this presentation we will describe the setting of the discovery as well as the material composition of this weapon and how new analyses lend insight into the design, construction and use of ancient hunting spears.

8 ANALYZING USE-RELATED FRACTURE VELOCITY ON TRAPEZOIDS IN THE EARLY UPPER PALEOLITHIC OF JAPAN TO EVALUATE THE PROJECTILE DELIVERY MODES

Author(s): Takakura, Jun (Archaeological Research Center, Hokkaido University) - Yamaoka, Takuya (Faculty of Humanities, Shizuoka University)

Presentation Format: Oral

In this paper, we would like to explore projectile technology during the Early Upper Paleolithic in the Japanese islands by analyzing edge damage and use-related fracture velocity on trapezoids. Trapezoids are a major formal flaked tool in the Early Upper Paleolithic and are thought to be used by the first modern human groups that migrated into the Japanese islands. A series of experiments using replicated trapezoids were conducted to investigate the relationship between the velocity of impact fracture and the projectile delivery modes (arrows, spearthrower darts, javelins, and spears). To measure use-related fracture velocity, this paper focuses on the fracture wings which are microscopic markings found on the fracture surfaces. We present the results of analyses of fracture wings observed on trapezoids from the several Early Upper Paleolithic sites, such as Doteue, Kojou, Hinatabayashi-B in central Japan. The results of analyses demonstrate that the Early Upper Paleolithic trapezoids were delivered mechanically. This may provide us with an important insight into the behavioral strategy and technology of the first modern human groups that migrated into the Japanese islands.

9 INVESTIGATING THE SOCIAL SPACE OF STRUCTURES AT THE EARLY MESOLITHIC SITE OF STAR CARR

Author(s): Bates, Jessica - Little, Aimée - Milner, Nicky (University of York)

Presentation Format: Oral

Mesolithic structures, identified through post holes, hollows and hearths, can provide rare glimpses into the daily lives of hunter-gatherers who are often associated with short-lived occupation and nomadic lifestyles. During recent excavations at the world-renowned Early Mesolithic site of Star Carr, North Yorkshire (UK), nearly 25,000 flints were found and at least three structures were identified. As a result of a multi-disciplinary analysis, it was possible to observe distinctions in tool-based activities within the concentrations of flint excavated from across the site; evidence of craftwork, including plant working, flint axe manufacturing and repair, hide and antler processing, as well as butchery and fish processing are just some of the activities identified to date.

An initial microwear pilot study of the structures indicates retooling and clearance as well as opportunistic, small-scale craft activities, sometimes on recycled projectiles: thus challenging traditional typo-functional models. The microwear results further suggest that there are possible distinctions in tool-based activities undertaken in and around the structures. However, the full extent and nature of these activities remains unknown, and it is still unclear how tool-using activities within the structures relates to those found across the site.

A more extensive sample of flint from inside the structures is being analysed to unpick and characterise the small-scale craft activities being undertaken in the structures. As a result, the social dimensions of tool use areas at Star Carr will be examined and the potential to gain new insights into the lives of hunter-gatherers who inhabited the site will be discussed. It is hoped that this research will add to discourse regarding the importance of implementing functional analysis of lithics, whilst exploring the social significance of structures within the context of the British Mesolithic and in Mesolithic Europe.

10 FUNCTIONAL ANALYSES OF THE EARLY UPPER PALEOLITHIC ASSEMBLAGE FROM ROMÂNEȘTI-DUMBRĂVIȚA, ROMANIA

Author(s): Chu, Wei (Institute of Prehistory; University of Cologne) - M, João Marreiros (TraCEr, MONREPOS, Archaeological Research Centre and Museum for Human Behavioral Evolution, RGZM) - Dobos, Adrian (Department of Paleolithic Archaeology, Institute of Archaeology "Vasile Parvan" of the Romanian Academy of Sciences) - Richter, Jürgen (Institute of Prehistory; University of Cologne)

Presentation Format: Oral

Formal functional analyses of early Upper Paleolithic assemblages have remained limited partly due to a dearth of newly excavated sites appropriate for analysis and the lack of appropriate methods for study. The aim of this paper is to fill the gap by presenting the results of a techno-typological analysis combined with use wear analysis of 346 lithic artifacts from the recently excavated Aurignacian assemblage from the large, stratified open-air site of Românești-Dumbrăvița in southeastern Romania. This site is located close to (c. 90 km), and is contemporaneous with, the oldest modern human fossils in Europe. Combined with geochemical analyses, we show that the Aurignacian assemblage of Românești-Dumbrăvița demonstrates good use-wear preservation on unburned pieces, with part of the assemblage demonstrating some form of functional evidence. These results contribute to a better understanding of both artifact techno-typologies in the early Upper Paleolithic and provides evidence of how the earliest modern humans in Europe subsisted in new ecosystems.

11 NEW EYES ON LITHIC TOOLS USED BY EASTERN SICILY HUNTERS-GATHERERS GROUPS

Author(s): Iovino, Maria Rosa (Istituto Italiano di Paleontologia Umana)

Presentation Format: Oral

Eastern Sicily territory shows a high variety of ecological, geological and geographical units. Prosperous wild fauna and wild vegetation were and still are, despite the lacking in the recent past of a smart ecological policy, key attractive characteristics to drive the late Paleolithic and Mesolithic hunter and gatherer groups towards places with resources. Are we able to deal in trying to reconstruct the broader spectrum of resource these people processed through lithic tools? When analysing lithic surfaces, it is common to meet with absent, unpreserved or undeveloped micro-wear / macro-wear traces. Sometime the poor presence/development of wear might be related to lack or short use, or maybe to a highly skilled user (?), or to the petrographic characteristics of lithic raw materials or to the structure and composition of worked materials. This work contributes through an assessing of traceological methodologies, traditional and third-millennium ones to a deeper understanding of past hunters-gatherers behaviour bringing the lithic implements into contact with the contexts under analysis. Wear traces observed on flint assemblage from eastern Sicily Mesolithic and Upper Paleolithic sites, among which rock shelter of Sperlinga S. Basilio, located on the Peloritani mountains, Corruggi Cave which is located nearby the coastland and Giovanna Cave, located not far from seaside and closer to the Hyblaean Mountains, will be here discussed together with the adopted analytical strategies.

A. USING STANDARDISED SAMPLES AND CONTROLLED EXPERIMENTS TO EVALUATE THE ROLE OF RAW MATERIAL IN LITHIC EDGE DURABILITY AND EFFICIENCY

Author(s): Pedernana, Antonella (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Malinsky-Buller, Ariel (MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Gneisinger, Walter (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Marreiros, Joao (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; ICAREHB, Interdisciplinary Center for Archaeology and Evolution Human Behaviour, University of Algarve)

Presentation Format: Poster

The organisation of hunter-gatherer lithic technologies entails decision-making regarding the raw material selection, integration of strategies for producing, using, transporting, and discarding tools. Thus, lithic assemblages are the outcome of long chains of decision-making processes. A less studied perspective on those decision-making processes is the role that raw material performance had on the past blank selection for tool use. The goal of this project is to evaluate the efficiency of lithic cutting edges according to raw material. Much work has been done to understand which parameters influence the efficiency and durability of cutting edges (e.g., Collins, 2008; McPherron et al., 2014; Dogandžić et al., 2015; Eren and Lycett, 2015; Key and Lycett, 2015). However, these studies were generally based on the use of knapped samples. In this way, edge morphology and surface topography diverge among samples.

In this study, we aim to assess the role of raw material in edge durability and efficiency during use. The novelty of this work is the use of a mechanical setup which allows testing one variable at a time while the others are kept constant. In such a set-up, factors such as force, friction, number of strokes, and velocity can be measured and quantified.

The first step of our experimental programme is to compare four fine and coarse-grained lithologies. Standardised samples (i.e. machine-cut) have been used to perform longitudinal unidirectional movements (in a whittling motion) on selected wooden specimens.

A 3D High-resolution scanner and a 3D digital microscope have been used to document the loss of material as well as changes in edge measurements and outline before use and after different stages of use (250, 500 and 1000 strokes).

Our observations on the analysed sample allowed us to evaluate the influence of the different properties of different raw materials on edge fracturing modes.

B. TECHNOLOGY AND FUNCTION OF NON-FLINT LITHIC ARTEFACTS DURING THE UPPER PALAEO-LITHIC: A CASE STUDY FROM SOUTHWESTERN FRANCE (LE LANDRY, DORDOGNE)

Author(s): Villeneuve, Quentin (UMR 5199 PACEA, Université de Bordeaux) - Brenet, Michel (INRAP; UMR 5199 PACEA, Université de Bordeaux) - Bracco, Jean-Pierre (UMR 7269 LAMPEA, Université Aix Marseille) - Ducasse, Sylvain (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Poster

Flint was the main lithic raw material used by hunter-gatherer groups in southwestern France. However, the archaeological record shows that a large variety of other lithic resources (quartz, granite, basalt, etc.) was collected and exploited. Due to its focus on flint artefacts, earlier research on Upper Palaeolithic lithic industries had a general lack of consideration towards other rock types and their techno-economic role. Over the last thirty years, a growing interest in this matter resulted in the adaptation of “classical” methods of flint lithic analysis in order to understand the technological, economic and functional aspects of non-flint lithic industries.

As a case study, we present the non-flint component of the Late Solutrean lithic industry from the open-air site of Landry (Dordogne, France). Our ongoing study, combining petrographic, technological and functional analyses, gives a glimpse of the importance these resources can have in hunter-gatherers’ activities. Alongside significant exploitation of local flint resources, this assemblage demonstrates the use of quartzite and dolerite cobbles. These two resources were used within the lithic production system, both as percussion tools for lithic reduction (hammerstones, anvils) and as raw material for blank production. A techno-functional analysis of numerous cobbles with polished surfaces also reveals their use in grinding activities. The presence of multifunctional tools and recycled implements shows the integration of diverse activities. This case study provides insights concerning the technological, economic and functional place of non-flint lithic artefacts in Upper Palaeolithic technical systems.

239 UN-PACKAGING NEOLITHIC SOCIETIES: FROM STATIC NOTIONS TO BOTTOM-UP MODELS OF SOCIAL ORGANIZATION

Theme: Archaeological theory and methods beyond paradigms

Organisers: Heitz, Caroline (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research) - Wunderlich, Maria (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Furholt, Martin (University of Oslo, Institute of Archaeology, Conservation and History)

Format: Regular session

Traditional ideas about Neolithic societies are shaped by questionable premises. Concepts of social and cultural coherence of residence groups and the ethnic interpretation of ‘archaeological cultures’ fostered ideas of static and homogeneous social entities with fixed borders. Farming – the core of the Neolithic way of life – was associated with sedentariness rather than with mobility. Furthermore, the widely used (neo-)evolutionist thinking assumed a universally growing social hierarchization in the course of prehistory. Such ‘top-down’-perspectives deprived individuals and groups of genuine agency and creativity. In recent years, a wide array of empirical results on social practices related to material culture and settlement dynamics, (inter-)regional entanglements and spatial mobility based on Stable Isotope Analyses, aDNA etc. have come to the fore. Yet the question of possible inferences regarding the social organization has not been sufficiently addressed.

The aim of the session is to study social practice and organization in Neolithic societies based on such results by adopting bottom-up perspectives. We want to discuss how data can be methodologically combined on the basis of corresponding theories as well as the potential of such bottom-up approaches to infer models of social organization which could live up to the diversity and dynamism of Neolithic societies. This might include perspectives on mobility, social complexity, the importance of (political) interests and factors of kinship etc. We welcome papers that address the following questions:

- What models of Neolithic societies are used in current research?
- What kind of premises are projected onto the past and why?
- What kind of data is available and how can we combine those to explore different forms of social organization?
- What theories are used to approach social organization in prehistoric contexts?
- How could archaeology benefit from anthropological perspectives?
- What are the epistemological limits regarding the social organization of Neolithic communities?”

ABSTRACTS

1 TERMS MAKE HISTORY. ON THE AGENCY OF “THE NEOLITHIC”

Author(s): Nordqvist, Kerkko (University of Helsinki, Faculty of Arts) - Piezonka, Henny (Christian-Albrechts-Universität zu Kiel, Institute of Pre- and Protohistoric Archaeology)

Presentation Format: Oral

In Eurasian Stone Age archaeology, two fundamentally different understandings prevail as to what is meant by the term “Ne-

olithic". In most parts of Europe, the Near East and Central Asia, the main characteristic is the transition from a foraging to a producing economy, a process that can be accompanied by a variety of other traits such as sedentism, the development of social inequalities, novel crafts and technologies, and the emergence of new ideological systems. In the Russian Federation, further parts of the former Soviet Union and the neighboring regions, on the other hand, the main criterion for the beginning of "the Neolithic" is the onset of ceramic vessel production, and hence, hunter-gatherer groups with pottery make up the majority of "Neolithic" communities.

Various attempts have been made to address this terminological discrepancy between "Eastern" and "Western" archaeological schools. Concentrating geographically in the intermediate area between the two poles (e.g., Poland, Finland, the Baltic States), they can be grouped into four categories: 1) Application of compromise labels such as "Sub-Neolithic", "aquatic Neolithic", "ceramic Mesolithic", 2) Search for early evidence of farming to prove a "true", agricultural Neolithic, 3) Postulation of two Neolithic processes, an agricultural and a non-agricultural, and 4) Revision of periodization terminology, generally from the eastern towards the western understanding of the term.

Just like the two main concepts, all of these compromise attempts are epistemologically problematic as they are rooted in the specific "Denkstile" (sensu L. Fleck) of the scientific schools involved, their historical backgrounds and contemporary political embeddedness. In our talk, we will show how these approaches go far beyond the problem of terminology, and how the term "Neolithic", actually, has in this respect become an agent itself in shaping the scientific agendas, influencing the formulation of research questions and designs, and pre-conditioning the answers and interpretations

2 FROM THE AEGEAN SEA TO THE PARIS BASIN: THE ECONOMIC DIMENSION OF SPONDYLUS EXCHANGE BETWEEN 5500 AND 5000 BC

Author(s): Windler, Arne (German Mining Museum Bochum)

Presentation Format: Oral

The current debate about Neolithic exchange is based on the contrasts between 'primitive' gifts and modern markets as well as the dichotomy between socially-embedded and capitalistic dis-embedded economies. Archaeological research on early exchange refers selectively to non-individualistic and normative approaches from anthropology and sociology, whereas economic and egoistic theories are rejected with a reference to such eloquent personalities like Marcel Mauss or Karl Polanyi.

One such example is the exchange of the Mediterranean shell *Spondylus gaederopus* in Europe between 5500 and 5000 BC. Bracelets, beads, and pendants made of the shell can be found from the Aegean Sea to the Paris Basin, and the distribution is often mentioned as a prestige good or gift exchange par excellence, but we have to be aware of a premature categorization. Furthermore, the classification as a gift can be an obstacle to the analysis of the practice of exchange. In order to get a deeper understanding of prehistoric societies, other ways of describing exchange have to be addressed. For this purpose, the paper first uses an alternative theory that divides exchange into a social, an economic and a time dimension. In a second step, the foreign trade theory will be presented in order to discuss the economic mechanisms within prehistoric societies. In a synthesis, the distribution of artefacts made of *Spondylus gaederopus* and the theory are integrated to illustrate the economic dimension during the Neolithic of Europe.

3 WAS THERE A PLAN? THE SPATIAL AND SOCIAL ORGANIZATION OF THE EARLY NEOLITHIC SITE OF ALTSCHERBITZ (GERMANY)

Author(s): Hohle, Isabel (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

How spatial organization is linked to social organization is a long discussed matter not just in Neolithic research. The talk will especially focus on current models and theories about social organization in settlements of the Linear and Stroke-ornamented Pottery Culture (short: LBK and SBK). The discussion seems still being influenced by the famous „Hofplatzmodell“ (courtyard model) as there are obviously some misunderstandings regarding the methods, assumptions and the model as a whole. Besides that, small scale and more detailed analysis dominate current research and overall „ideas“ and models are discussed to a lesser extent.

Thanks to largescale excavations in Central and East Germany, lots of Early Neolithic sites had been detected there. One of them is Altscherbitz near the city of Leipzig (Saxony, Germany). This site is very special as it consisted of a large LBK settlement with graveyard and some kind of „pioneer houses“ as well as a small SBK settlement – all in one place and excavated in their complete dimensions. This opened up new extensive perspectives on Early Neolithic settlement organization and will be taken as the basis for the talk's subject.

4 WHAT CAN ONE SITE TELL US ABOUT NEOLITHIC SOCIETIES? THE CASE STUDY OF LBK SETTLEMENT AT LUDWINOWO 7, COMM. WŁOCŁAWEK

Author(s): Pyzel, Joanna (University of Gdańsk, Institute of Archaeology and Ethnology) - Kabaciński, Jacek - Osypińska, Marta (Institute of Archaeology and Ethnology, PAS) - Szydłowski, Marcin (University of Szczecin)

Presentation Format: Oral

This presentation addresses the issue of Early Neolithic societies from the perspective of a single site. Ludwinowo 7 is a big Linear Pottery Culture settlement in Kuyavia (north-central Poland) which was excavated due to a large-scale motorway project.

It had been occupied by the first farming communities over a relative long time span of not less than six phases with at least four-six contemporary houses existing in each phase. This spatial and temporal dimension of research enables the study of the local community at various micro-regional levels: house – household – neighbourhood – village. In our presentation we bring together results of analysis of various data: portable (pottery, flint and stone artefacts as well as animal bones) as well as non-portable (features, especially long houses). Our integrative study focuses on the issue of heterogeneities and complexities among LBK inhabitants of Ludwinowo which offers a bottom-up approach contributing to discussions on the social organisation of the first farmers in Central Europe.

5 IDENTIFICATION OF POST-MARITAL RESIDENCE PATTERNS IN PREHISTORY THROUGH CROSS-CULTURAL RESEARCH. A CAUTIONARY TALE

Author(s): Kvetina, Petr - Hrnčíř, Václav (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Oral

Cross-cultural researchers have demonstrated that in agricultural societies, large dwellings are strongly associated with matrilocal— or the practice where new families live in the same community as the wife's family. In contrast, smaller dwellings are strongly associated with patrilocal societies, where newlyweds live in the communities of the husband. This is interesting finding for many archaeologists, since dwelling size is a variable that can be determined across a multitude of archaeological sites. For example, the Neolithic period (5500 – 4900 BC) in the European Temperate Zone (LBK) is well-known for the tradition of longhouses with length up to 45 m. On the other hand, archaeological record provides little information about the family organization and post-marital residence during this time. Unfortunately, the in-depth re-examination of the correlation between large household floor area and matrilocal among anthropological societies do not support the original hypothesis. The previous datasets were not controlled for phylogenetic non-independence, that arises through patterns of shared common ancestry, which caused that results were biased. The aim of this contribution is to present results of our restudy and discuss the limitations of cross-cultural research for archaeology in general.

6 WIDENING HORIZONS AND RE-EVALUATED PRESUMPTIONS: ACHIEVEMENTS AND CHALLENGES IN THE RECENT ARCHAEOLOGICAL RESEARCH OF EARLY FARMING COMMUNITIES IN WESTERN HUNGARY

Author(s): Oross, Krisztián (Hungarian Academy of Sciences, RCH, Institute of Archaeology) - Gortva, Gergely (Hungarian National Museum, Archaeological Heritage Protection Directorate) - Jakucs, János (Hungarian Academy of Sciences, RCH, Institute of Archaeology) - Lyublyanovics, Kyra (Central European University, Department of Medieval Studies) - Marton, Tibor - Serlegi, Gábor - Vágvölgyi, Bence (Hungarian Academy of Sciences, RCH, Institute of Archaeology)

Presentation Format: Oral

Neolithic research in Hungary followed a different trajectory than in other central European regions. The lack of investigations on extended 6th millennium cal BC Neolithic settlements in western Hungary was particularly evident. This shortcoming hindered Hungarian scholars from creating theories and models on settlement dynamics and social organisation comparable to results from e.g. the Merzbachtal, the Aisne valley, and Bylany. As a consequence, one had to face less canonised arguments, and the number of useful earlier studies is also very limited. Large-scale excavations that took place prior to infrastructural developments changed the situation fundamentally, at least in terms of available assemblages. However, successful discoveries are by no means equivalent to series of datasets suitable for complex analyses. In addition, the application of a wide range of new scientific methods found Hungarian archaeological research in a transitory state, when it had just started to work on its backlogs utilizing recently obtained source materials.

Bearing this legacy in mind, our contribution attempts to provide an overview of Neolithic sites from western Hungary. Both the potentials and limitations are investigated from the perspective of building models of processes, networks, and social organisation. Our study mainly relies on architecture, settlement structures, micro-regional research, and the analyses of various types of artefacts on the one hand. On the other hand, a special emphasis is given to recent results achieved through an increasing adoption of methodologies from the natural sciences, especially absolute chronology and aDNA analysis. Through these efforts we aim to gain a better understanding of flexible systems of organisation and mobility in past societies, and to synthesise different types of datasets.

7 BACK TO THE GROUND FLOOR – DETECTABLE SOCIAL ENTITIES AT THE COPPER AGE SITE IN RÁKÓCZIFALVA (HUNGARY)

Author(s): Szilágyi, Márton (Hamburg University) - Faragó, Norbert - Siklósi, Zsuzsanna (Eötvös Loránd University, Institute of Archaeological Sciences)

Presentation Format: Oral

The newest theories about the concept of the „archaeological culture” got into the focus of attention of the Hungarian and Central European archaeological research concerning the Early and Middle Copper Age (ECA-MCA). The theoretic questions within the debate about archaeological culture occurred in practice during the reconsideration of the formerly accepted typo-chronological model of this period.

The triggering event of the remodelling process of this period was the excavation of a complex Copper Age site (Rákóczifalva-Bi-

valy-tó Site 1/c) on the Great Hungarian Plain. Here, a complete cemetery of 79 graves and a whole settlement was uncovered, which were separated by a 100-120 m wide empty zone. Further two contemporary Copper Age sites were unearthed within a few kilometres away.

The traditional typo-chronological system fell to pieces due to the AMS-dates from the Rákóczifalva cemetery and other ECA-MCA sites. Thus, the model based on the consecutive phases of the ECA Tiszapolgár culture (formerly 4500-4000 cal BC) and the MCA Bodrogkeresztúr culture (formerly 4000-3600 cal BC) could not be maintained anymore. The new situation, in which these two cultures had a significant chronological overlap in the second half of the 5th millennium cal BC, required not only a new model, but also a new theoretical approach. It also became obvious, that the „top-down” perspective did not work.

It was the reason why we tried to build a new, bottom-up model of the Rákóczifalva site and its microregion without taking the prior cultural models into consideration. We took social entities that can be recognised in the archaeological record, as a basis. Due to the variegation of the finds, we could approach the problem from different theoretical and practical perspectives. In our presentation, we would like to show the detectable social units and entities, social relations and borders within the settlement-cemetery-microregion triangle of Rákóczifalva.

8 THE SOCIAL STRUCTURE OF THE EARLY ENEOLITHIC COMMUNITIES FROM THE TERRITORY OF POLAND IN THE FUNERAL RITE PERSPECTIVE

Author(s): Wilk, Stanislaw (Institute of Archaeology of the Jagiellonian University, Kraków)

Presentation Format: Oral

The second half of the 5th millennium BC and the beginning of the 4th millennium BC was a period of the development of the oldest Eneolithic society in the territory of Poland. Depending on the differentiation of the ceramic style as well as funeral rites, settlements and cultural patterns there were classified into four bigger taxonomic units: the Brześć Kujawski Group of the Lengyel culture, the Jordanów culture, the Malice culture and the Lublin-Vollhynian culture. All of these units formed on the base of the local variants of older Danubian societies. However, each of them reacted differently to the civilisation transition, which took place in the Balkans and Carpathian Basin in the period described. The changes touched various areas of life, but the most important occurred in the sphere of funerary practice. The visible effects of these new cultural stream were a new approach to the location and organisation of the cemeteries and a new character of the funeral rites paying more attention to the sex and the social status of the dead. For the purpose of presenting differences in the way of adapting Copper Age social patterns in the environment of post linear communities that lived north the Sudetes and Carpathian Mountains, a combination of available archaeological, anthropological and biological data has been applied. As a result we can look at the described period from a broader – beyond cultural perspective. This study was supported by the National Science Centre of Poland (grant: Adaptation of Transcarpathian cultural patterns of the Copper Age within the younger Danubian cultures in the Lesser Poland Upland, UMO-2017/25/N/HS3/01140).

9 THE LITHIC PROCUREMENT AND PRODUCTION ACTIVITY IN THE LATE NEOLITHIC PERIOD IN THE SOUTH PART OF TRANSDANUBIA

Author(s): Szilagyi, Kata (Mora Ferenc Museum)

Presentation Format: Oral

Starting from an analysis of the 6200 chipped stone tools of the Late Neolithic Alsónyék–Bátaszék site (Southeast-Transdanubia, Hungary), this contribution will explore the following questions, related to main raw material used: the Mecsek radiolarite: 1. What were the criteria of selection and strategies of procurement of the knappable lithic raw materials? 2. What production methods can be identified in connection with the use of the local raw material at Alsónyék and in the Southeastern group of the Lengyel culture? 3. Which were the Late Neolithic sites in the Great Hungarian Plain where the Mecsek radiolarite appears? 4. What was the value of this radiolarite type in Transdanubia and Great Hungarian Plain? 5. What kind of exchange network was connected to the Mecsek radiolarite? 6. Can we reconstruct the distribution routes of this radiolarite?

Beside the presence of trans-regional flints, the greatest quantity of the lithic raw material in Late Neolithic in Transdanubia and the Great Hungarian Plain is radiolarite from the East-Mecsek Mountains. This is a raw material of good quality and available in sufficient quantities to cater the raw material demand of the region. The geological sources of this radiolarite were located very close to Alsónyék. The patterns of raw material distribution, indicate very strong local networks around the Alsónyék site. This tendency is very similar the contemporaneous Lengyel settlement like Zengővárkony, Pécsvárad-Aranyhegy, Lengyel-Sánc, Villánykövesd and Mórággy–Tűzkődomb also.

Investigating the nature and significance of the use of local raw materials, this contribution will discuss the results of an ongoing geoarchaeological research project in the eastern part of the East-Mecsek Mountains focused on locating and documenting the exact geological sources of local radiolarite in order to reconstruct the procurement strategies. These findings will be put into a larger perspective of Late Neolithic southern Transdanubian interaction networks.

10

A SIGN OF MOBILITY AND CULTURAL EXCHANGE? CERAMICS WITH SCRIBBLE LINES AND IMPRESSIONS ORNAMENTATION FROM THE LYSA HORA CEMETERY (UKR)

Author(s): Andriiovych, Marta - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory) - Shydlovskiy, Pavlo (Taras Shevchenko National University of Kyiv, Faculty of History, Department of Archeology and Museology)

Presentation Format: Oral

At the Lysa Hora cemetery, 50 graves with nearly 80 vessels were discovered. It belongs to the IIB period of the so-called Azov-Dnieper culture, dated near 5200—4750 years BCE. For the Dnieper-Donetsk region, three types of ornamentation on ceramics were common: comb prints, impressions, and scribbled lines. In the first period, typical ornaments are comb prints and scribbled lines, in the second-period triangular impression. In my view, the observable differences in the vessels' ornamentation, as well as differing admixtures in the clay could be explained by two hypotheses:

1. The migration (permanent residential mobility) of social groups to the Dnieper-Donetsk region.
2. Phenomena of exchange beyond the Dnieper-Donetsk region between different social groups having different pottery production practices.

Comb ornamentation was most common in Ukrainian Neolithic. But in the second period, impressions became the most popular ornamentation, whereas the linear ornamentation almost disappeared.

If the comb ornamentation was created in the Middle part of Dnieper river or spread with three different waves of the sea migration of social groups making the Cardium pottery style, and another influence came from groups, who made ceramic with triangular impressions, we can suppose that scribbled linear ornamentations could be a local invention within the Bug-Dniester pottery style in the Early Neolithic.

Questions remain: Are combinations of different types of ornamentation the result of an exchange between culturally different groups and/or phases of adaptation and integration for the newcomers? And in both cases, what could this tell us about mobility, cultural exchange social organization in the Neolithic in the Middle Dnieper region?

11

UNIFICATION, DIVERSITY AND THE ISSUES OF SOCIO-CULTURAL INTERPRETATION OF 'ARCHAEOLOGICAL CULTURE'

Author(s): Diachenko, Aleksandr (Institute of Archaeology of the NAS of Ukraine) - Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań)

Presentation Format: Oral

Since the remarkable study on spatial analysis in archaeology by Hodder and Orton (1976), numerous papers noted that very different prehistoric processes and phenomenon are recorded by similar statistical patterns. Respectively, this causes different socio-cultural understanding of 'archaeological culture'. In its simplest definition, this term means nothing but a certain way of similarity in material assemblages. Therefore, we applied information theory to study unification and diversity in the dynamics of 'cultural development'. This paper supported by the grant from the NSC of Poland aims at the following issues. Are there any most general trends of cultural development, which may be misunderstood for the markers of migrations or increase in interactions? Do we overestimate 'mobility' as an explanation for culture change after the recent advances in aDNA, strontium isotopes analysis etc.? How the most general laws of cultural development are correlated with regional socio-cultural dynamics? These issues are developed through the case studies on the Neolithic Cucuteni-Tripolye cultural complex and Eastern group of Funnel Beaker culture.

12

MOBILITY IN NEOLITHIC SOCIETIES – POTTERY AS INDICATION FOR HORIZONTAL SOCIAL ORGANISATION?

Author(s): Heitz, Caroline - Hinz, Martin - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research)

Presentation Format: Oral

The paradigm of cultural history still has an influence on how we imagine Neolithic societies. Once established for the purpose of relative chronology and based on pottery, Neolithic cultures implied the existence of homogeneous, static social units with more or less clear spatial-temporal boundaries. Even if their initially ethnic interpretation has long been rejected, the prevention of any other social interpretations led to a blind spot, which was filled unintentionally by top-down projections of premises onto the past. Furthermore, there is also a lack of epistemological and theoretical reflections on what determines different forms of social organization and how they could be approached archaeologically. How can things, social practice and social organization be related to each other?

Following that question we explore what could be inferred from pottery production practices regarding social organization. Ceramics from precisely dendrodated Neolithic wetland sites of the Northern Alpine Foreland of the period between 3950 and 3800 BCE will be taken as an example. Inspired by P. Bourdieu's theory of habitus and social practice we have developed a mixed method bottom-up approach to explore typical local pottery production practices in a settlement perspective (micro level). Following E. Wenger it is assumed that pottery was produced in communities of practice leading to the (re)production of typically local pottery styles. However, shifting to a supra-regional perspective (macro level) it can be shown that stylistic plurality in settlements was not an exception but the rule, indicating cross-regional entanglements and spatial mobility between settlement

communities with different pottery production practices. Provenance analyses of materials speak for residence-based mobility of individuals or subgroups – reminiscent of so-called segmentary societies. Although the latter concept is problematic, we propose that pottery from settlement contexts has the potential to indicate residence patterns and horizontal aspects of social organisation in Neolithic societies.

13 REPEATABILITY IN DIVERSITY. SOCIAL ORGANISATION IN CENTRAL EUROPEAN LATE 4TH MILLENNIUM BC

Author(s): Bleicher, Niels (Underwaterarchaeology / DendroLab City Of Zürich)

Presentation Format: Oral

What proxies can provide us with information on social organisation, when there are no cemeteries to be studied? At the example of circumalpine Neolithic lakeside settlements it can be shown, that very different indications have been used to infer social organisation from find distributions. Which approach was correct? Or is it realistic, that every studied community had its own system of signs and symbols? The settlement layouts seemed to be equally variable and were difficult to interpret.

Recently, first evidence was presented that these different settlement layouts may be reduced to different combinations of recurring modular basic elements. Within these we found for the first time, that distribution patterns of the same find categories proved helpful in different settlements. It seems therefore, that a starting point has been found. Furthermore, the first linear models of find distributions were produced in an attempt to explicitly formulate assumptions and check one's understanding of deposition patterns. While it is necessary to embrace diversity, one neglected element of research might be repeatability. Data are presented that indicate the existence of inheritable social functions in Late Neolithic societies.

A second approach is more speculative and uses recent results on the Neolithic economy to reflect on possible competences that people in the aforementioned inherited functions may have had.

14 FROM PILES TO SOCIAL SPACE: TEMPORAL AND SPATIAL DYNAMICS IN PILE DWELLING SOCIETIES

Author(s): Ebersbach, Renate (Landesamt für Denkmalpflege Baden-Württemberg)

Presentation Format: Oral

Due to dendrochronology, runtimes of houses and settlements can be studied with a very high temporal resolution on the year-level in pile dwellings. The results of the prealpine Neolithic period (4500-2000 BC cal) confirm high settlement dynamics with rapid growth and shrinking, with single sites often covering not more than 10 – 15 years, single houses even less. Thus it appears that every individual moved several times in its life.

Intra-site organisation and the spatial distribution of material culture often show distinct diversities between houses, but also higher degrees of similarity, interaction and patterns of sharing between some – often neighboring - houses.

In this presentation I will argue that such short living settlement patterns with frequent relocations of people and sites indicate social structures with a low level of spatial control and a high level of individual – or small group – mobility. Further considerations about possible connections between spatial patterns and social and economical patterns are based upon the structuralistic « correspondence – noncorrespondence » approach (Hillier/Hanson 1984 : The social logic of space). Further hints towards a high spatial dynamics of individuals and small groups might be found in material culture distribution patterns. Also, the question of the smallest and biggest decision making units and how they interact with each other and the environment could be interesting to understand possible reasons for the observed high spatial and temporal dynamics in Neolithic wetland societies.

15 MICHELBERG: JADE AXES, MEGA-SITES AND SHIFTING SEDENTISM

Author(s): Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum; Johannes-Gutenberg University Mainz) - Shenjere, Plan (University of Zimbabwe)

Presentation Format: Oral

The Young Neolithic Michelsberg Culture (4300-3500 cal BC) has been a miracle for many decades. With little to no evidence for house structures, but impressive evidence of enormous enclosures, an apparently reduced agricultural spectrum and an alleged emphasis on herding, Michelsberg has escaped traditional conceptions of early farming societies in Temperate Europe.

More appropriate appear interpretations drawing on evidence from societies with a strong agropastoral component and a settlement system characterized as “shifting sedentism”. Such societies have been and are continuously documented in eastern and southern Africa. We present ethnohistoric and ethnographic evidence from Zimbabwe, and try to sketch out a model for the “Michelsberg System”.

What emerges is a complex model of societies with short-term relocation of their farming hamlets and villages, but whose broader land-use strategy is focused around fortified aggregation sites of which at least some may have had ritual components. Major Michelsberg sites were aligned along long-distance exchange routes, which may have channeled cattle over medium ranges and also salt and jade objects in a complex system. This system emerged around 4200 cal BC and reached a tipping point between 3800 and 3600 cal BC, after which it declined rapidly.

16 WHAT HAS HAPPENED TO ACEPHALOUS SOCIETIES? DECONSTRUCTING AN ANTHROPOLOGICAL CONCEPT TO UNDERSTAND SOCIAL REALITY

Author(s): Förster, Till (University of Basel)

Presentation Format: Oral

Acephalous societies (ἀκέφαλος, “headless”) were a prominent concept of British anthropology. Evans-Pritchard’s work on the Nuer and Fortes’ on the Tallensi introduced the concept to anthropology. At the time, foraging societies were known as having no central political organisation, presumably representing the ‘oldest of human history’. But most colonial officers assumed that pastoralists as the Nuer and agriculturalists as the Tallensi would unavoidably have headmen or some other form of centralised social organisation. That big settlements and large areas were “ungoverned” and acephalous challenged colonial thinking.

As a concept, ‘acephalous’ had been a tremendous success. From anthropology, it moved into disciplines such as political science and archaeology. It seemed to provide a reliable analytical framework to study systems of checks and balances that kept conflicts and eventually violence at bay. That these checks and balances were stable was taken for granted – and their stability was often projected on the past, assuming that acephalous societies had existed in precolonial times as they had been described and analysed in the 20th century: If you know what an acephalous society is, then you also know what it is to have an acephalous society under colonial domination.

However, the land of the Nuer became one of the most brutal battlefields that the continent has ever seen. One may deduce from this assessment that such systems of checks and balances owed their stability more to the overarching power of the colonial state than to their own capacities to settle conflicts. And the Tallensi may still be a peaceful acephalous society because the Ghanaian state is comparatively strong and able to sustain their social organisation from above. So, what is the concept of acephalous societies good for? What does the fate of acephalous social orders tell us about the *longue durée* in Africa and elsewhere?

17 NEGOTIATING POWER IN NEOLITHIC COMMUNITIES – THE POLITICS OF COHABITATION

Author(s): Furholt, Martin (University of Oslo)

Presentation Format: Oral

Neolithic communities are often either described as the cradles of emerging private property and social inequality or as egalitarian, but politically static entities. More recently, inner- and inter-community dynamics have been highlighted, and different lines of social conflict have been discussed in the context of early sedentary, food-producing communities in different parts of Europe. In this paper, I want to explore the interrelation and interaction of different social actors and units in Neolithic communities, relating to distribution, exchange and sharing of resources, and different, potentially conflicting, levels of decision-making. I want to explore the role these negotiations over power might have had for the social composition and political organization of communities. In connection to this I want to discuss the potential interaction between the local politics, and regional mobility and regional interaction patterns. These topics will be approached using a bottom-up approach, concentrating on a number of case studies from the European Neolithic.

18 BEYOND BIOLOGICAL BONDS – THE MULTIFACETED PERCEPTION OF KINSHIP-STRUCTURES IN AN ETHNOARCHAEOLOGICAL PERSPECTIVE

Author(s): Wunderlich, Maria (Institute of Pre- and Protohistoric Archaeology, University Kiel)

Presentation Format: Oral

Given the different phases and regions of the Neolithic in Europe, the interpretations of those societies should be highly variable and reflect the broad spectrum of cultural traits. Instead, they often follow repeated narratives with too little differentiation. A theoretical and methodological framework which is in itself adaptable and reflecting a broad spectrum of social mechanism and behaviors would offer an improved foundation towards the interpretation of social systems.

The importance, functions and organization of kinship structure had been long recognized and constitutes a relevant topic in Neolithic archaeology. Apart from the fundamental importance of kinship-structures for the interpretation of Neolithic societal organization, recent improvements of aDNA-analyses are receiving wide attention. Both of these aspects demonstrate the need of a well-developed theoretical understanding of kinship.

In this talk, I will focus on the different forms and meanings of kinship, as they are documented within ethnoarchaeological case studies. These examples show, that the interpretation and analysis of such a complex topic must be based on holistic viewpoints and integrate different data-sets when researched in archaeology. Among them, and of highest importance, are aDNA-analyses, which shed a light on biological relatedness within Neolithic communities. Nevertheless, biological relatedness represents only one form of a much broader understanding of kinship. Equally important are different forms of relatedness, which might be based on and shaped by factors such as everyday interaction, social obligations, interdependencies and mutual aid. All these factors together form diverse frames, in which kinship is evolved and maintained.

In order to address these topics I will present an ethnoarchaeological case study (Sumba, Indonesia), which is showing an open understanding of kinship based not only on biological relatedness, but also on networks of action and collective structures. It will be discussed, to which extent these factors may be identifiable within the archaeological record.

19 **ARCHAEOLOGY OF LOCAL INTERACTIONS. IS THAT A WAY HOW TO REVEAL NEOLITHIC SOCIAL STRUCTURES AND MOBILITY PATTERNS?**

Author(s): Kolar, Jan (Institute of Botany of the Czech Academy of Sciences; Masaryk University)

Presentation Format: Oral

The supposed uniformity of material culture and burial rite of the Final Neolithic archaeological cultures was in the past (especially culture historical) interpretations related to mass migrations. Although these interpretative frameworks were undermined during the second half of the 20th century, the recent onset of the stable isotope and aDNA analyses brought it back. More importantly it seems that these results are often interpreted with only limited insight from archaeology or social anthropology. Nevertheless, detailed archaeological analyses of the archaeological evidence combined with theory gives us another important line of evidence of the prehistoric mobility. This paper will show on the example of the Corded Ware culture from Moravia (Czech Republic) how detailed quantified analyses of the archaeological evidence can contribute to the exploration of social structure and mobility patterns. Taking into consideration the complete archaeological record from the region I will present what is the relationship between the traditional definition of archaeological culture and the reality of the past societies and how we impose our current social models on them. This paper will also explore the ways how archaeologist can understand the prehistoric social practices on the local and regional level which is crucial for the bottom-up approaches and should precede large-scale syntheses.

20 **THE APPLICATION OF ANTHROPOLOGICAL ANALYSES OF OCCUPATION ON BELL BEAKER "ARCHER" BURIALS IN EUROPE**

Author(s): Ryan, Jessica - Desideri, Jocelyne (University of Geneva) - Villotte, Sébastien (University of Bordeaux) - Besse, Marie (University of Geneva)

Presentation Format: Oral

Interpretations of individual identity are often based solely on archaeological context and basic osteological analyses. Studies examining enthesal changes (modifications of musculoskeletal insertions) can provide archaeologists with a more complete grasp of occupation and daily life in prehistoric populations.

This study uses such an anthropology-based methodology to respond to archaeological questions concerning the "archer" burials of the Eastern Bell Beaker complex (~2800-2000BC). Individuals interred with an archery context are currently interpreted as archers. However, since the objects are possibly symbolic, there is no reason why their placement and function within the grave could not also be symbolic. The first step of our study therefore requires an anthropological methodology aimed at identifying traces of specialized archery, or not, on the skeleton in order to establish the relationship between the grave goods and the individual. To do this, Bell Beaker individual inhumations from Lower Austria (n=9), Upper Austria (n=4), Bohemia (n=71), Moravia (n=43), and Bavaria (n~80) were examined. Analyses include age and sex determinations, measurements, and the scoring of enthesal changes. The next, archaeological step of our study looks at the evidence for Neolithic warfare in general and Bell Beaker archery specifically, with a focus on the concept of specialization.

Our results should provide three primary insights: the efficacy of using enthesal changes to interpret possible occupation, if "archery" burials were for specialized archers, and the placement of a suspected archer within the greater population. These responses may then provide insights to archaeological questions concerning the function of archery-related grave goods, the implications of warfare on daily life, and the social organization within a society containing specialized warriors at the end of the third millennium BC in Central Europe.

21 **REVISITING SOCIAL AND SYMBOLIC PRACTICES THROUGH THE TECHNOLOGICAL ANALYSIS OF NEOLITHIC POTTERY: NEW DATA FROM THE PETIT-CHASSEUR NECROPOLIS (SION, SWITZERLAND)**

Author(s): Derenne, Eve (Laboratoire d'archéologie préhistorique et anthropologie, Université de Genève) - Ard, Vincent (UMR 5608 TRACES, Université Toulouse Jean-Jaurès) - Besse, Marie (Laboratoire d'archéologie préhistorique et anthropologie, Université de Genève)

Presentation Format: Oral

In this presentation we plan to revisit the social and symbolic practices observed at the Petit-Chasseur necropolis in Sion (Valais, Switzerland) through the technological analysis of its Final Neolithic and Bell Beaker pottery.

The results we will present are part of an ongoing SNF research project at the University of Geneva (2017-2021, PI M. Besse, and more specifically of a PhD thesis, Derenne) centered on social interactions and filiations in the Upper Rhône valley during the Final Neolithic, the Bell Beaker Culture, and the Early Bronze Age (2800-1800 BC).

Over the course of a millennium, Petit-Chasseur prehistoric populations erected and used 12 megalithic monuments accompanied by anthropomorphic stelae. During this time the site underwent several considerable changes in its status and architecture, with the addition of adventitious cists, the violation of several dolmens, and the construction of cairns in four different phases.

The technological analysis of pottery – following the chaîne opératoire concept – allowed us to trace back to the manufacturing traditions of the people that used the necropolis. These data on fashioning, finishing treatments, and decoration techniques, combined with the information on the type of pottery deposit, show that the traditions changed significantly during these three periods. These data therefore validate the idea that the site was subject to major modifications throughout its occupation, both

in terms of its function and use, and help us better understand the social and symbolic dynamics that unfolded in this central part of the Upper Rhône valley.

22 PURGING OUR APPROACH TO NEOLITHIC SOCIETIES: A CRITICAL REVIEW OF THE TERMS, ANALYTICAL CATEGORIES AND CULTURAL CONCEPTS USED IN RESEARCH

Author(s): Röder, Brigitte (Universität Basel)

Presentation Format: Oral

Empirical research, the integration of methodological and theoretical approaches adopted from the social sciences as well as aDNA and isotope analyses are significantly changing our view of the social conditions in the European Neolithic. Although this change might seem almost imperceptible, it is nevertheless fundamental in terms of both historical interpretation and epistemological approaches.

This can be seen, for example, in the integration of new terms and analytical categories such as 'communities of practice', while other terms such as 'society' or 'culture' are increasingly being avoided though ultimately not explicitly rejected. Boosted by the use of new methodological and theoretical approaches, the inventory of terms and analytical categories is thus constantly extended. The terminology is becoming more diverse, but at the same time also increasingly incoherent. One of the two main objectives of my paper is to reorganize this ever-growing array of tools and to stimulate a discussion about whether some of them could or should be winnowed out.

My second concern is to address the astonishing persistence of certain cultural concepts around the alleged 'fundamental forms of human cohabitation'. These include, for example, the notion that biological nuclear families are 'the germ cells of all societies', and the tendency to project modern gender stereotypes onto prehistory. Despite the process of change mentioned above, such ideas still shape current research. This is reflected, above all, at the historical interpretation level, which, as a result of cross-fading with cultural concepts, falls short of the innovative potential of new approaches, questions and perspectives.

Against this background, the 'un-packing of Neolithic societies' should be accompanied by a 'purging of Neolithic societies' since it is only by carrying out a critical review of the terms, analytical categories and cultural concepts, that the current process of change will be allowed to develop its full potential.

23 ABANDONING NEOLITHIC SOCIETIES? A PRACTICE-BASED APPROACH

Author(s): Veling, Alexander (Freie Universität Berlin)

Presentation Format: Oral

The paper provides an outsider's view on the discussion of the Neolithic. This gives the opportunity to reflect central theories, assumptions and narrative elements in this field of research by asking naïve (=uninformed) questions on its basic concepts and their theoretical interaction. What possibilities are discussed to bridge the scalar gap from the archaeological record to macro-phenomena like society, culture or the Neolithic? Do we still need accumulative concepts, or should we keep single elements of the archaeological record disconnected? Are there solid methodologies for macro-research based on the archaeological record? And should we abandon macro-concepts at all?

These questions are based on the detailed reflection of practice-based approaches in German-speaking Sociology discussed in the paper by presenting three central elements of practice theories and the concept of an "archaeology of practices", developed by the author. On this basis the paper will discuss if there is a theoretical connection of practices and the archaeological record and how we can approach it empirically. The big question behind is what we can learn about societies and cultures of the Neolithic and if we can learn anything at all.

240 "SWEET DREAMS (ARE MADE OF THIS)": SUGAR POT PRODUCTION AND CIRCULATION IN EUROPE AND THE MEDITERRANEAN IN MEDIEVAL AND POST-MEDIEVAL TIMES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Montesana, Roberta - Buxeda i Garrigós, Jaume (Universitat de Barcelona) - Jones, Richard (University of Glasgow) - Teixeira, André (Universidade Nova de Lisboa)

Format: Regular session

Nowadays demonised as responsible for numerous diseases, in the past sugar was a highly valued commodity, whose production and consumption had a huge impact on our social, cultural and economic development. Sugar cane production entailed an "industrial organization" from its cultivation to processing and distribution, as well as knowledge transfer and new technological requirements linked to production. The introduction of sugar cane into the Mediterranean areas followed the Islamic expansion from the 8th cent. AD. The synergy of craftspeople, workforce, local and foreign entrepreneurs transformed sugar cane production into one of the first industries in post-Roman times. For these reasons, sugar production has become one of the most discussed topics in the literature over the last two centuries. However, the crucial role that craftspeople played in the success of the process has been only marginally tackled.

This session aims at discussing the impact that the introduction of sugar production had on communities in Europe and in the Mediterranean areas, using as a baseline one of the crafts linked with sugar production: the manufacture of sugar pots. These constitute highly specialised vessels in the cane sugar-making process: their design and characteristics are specifically devel-

oped to allow the crystallization of the sugar. Little is known whether these vessels were imported or produced locally, whether itinerant potters brought with them the know-how or local ceramists adapted their tradition to produce such specialised vessels. More specifically, the session wants to explore the research on sugar pots from European and Mediterranean areas by addressing the following themes: 1) sugar pot manufacturing technology and its changes over time; 2) circulation of sugar pots and craftspeople across the wider Mediterranean and European areas; 3) the function of the sugar pots in the sugar-making chaîne opératoire. We welcome papers focusing on interdisciplinary approaches to the study of sugar pot function, manufacture and circulation in medieval and post-medieval times.

ABSTRACTS

1 SUGAR POTS IN THE LEVANT: MANY QUESTIONS, SOME ANSWERS

Author(s): Jones, Richard (University of Glasgow) - Grey, Anthony (Sandwich, Kent)

Presentation Format: Oral

This paper arises out of the study by Anthony Grey and the presenter of the sugar pots from the medieval (mainly 13th-14th century) sugar installation at the Tawahin es-Sukkar situated near the modern town of Safi, at the southern end of the Dead Sea in Jordan. Having briefly presented the morphological and material characteristics of these pots and compared them with their counterparts from elsewhere in Jordan and Palestine, this paper will consider issues to do with the manufacture and distribution of sugar products. They include the following: (a) the roles in the sugar-making process of vessels such as basins and for storage alongside the well-known conical mould and molasses jar, (b) the identity of the purification/clarification agents, (c) the individual stages in the sugar-making process as depicted in the 18th century painting in the Correr Museum, Venice. Finally (d) an explanation for the apparent contrast between the plentiful evidence that many sugar pots were used once and thrown away, while others were recycled; in addition, most importantly, some pots, travelling with their contents, were involved in the chain that led from primary production to secondary refining to selling/consumption centre.

Grey A. and R. Jones, 2017, Sugar vessels, in R. Jones (ed.), *Sweet Waste: Medieval sugar production in the Mediterranean viewed from the 2002 excavation at Tawahin es-Sukkar, Safi, Jordan*, Glasgow, 55-77.

2 NEW EVIDENCE FOR SUGAR IN NEA PAPHOS, CYPRUS

Author(s): Vassiliades, Anthoulla (Nicholson Museum, University of Sydney)

Presentation Format: Oral

Recent excavations at the site of the Hellenistic-Roman Theatre of Nea Paphos, in Cyprus, have brought to light a number interesting features and finds relating to the Crusader, Venetian and Ottoman periods of Nea Paphos. A significantly sized building located at the top of the hill behind the theatre has been discovered, containing a large number of sugar cones and jars and some imported fine ceramics from Turkey and Asia. Very preliminary research indicates that the local and imported ceramics date from the 13th to 17th century, though it is still too early to date this building definitively. The sugar moulds and jars seem to date from the 13th to late 15th centuries. Sugar-related pottery has been found in increasing quantity throughout the theatre site and may be indicative of longer term storage in the vicinity of the harbour at Nea Paphos. A building such as this, located at the northeast entrance of the town and on the main road from Achelia and Kouklia (known for its sugar production), within easy reach of the harbour would be necessary. The theatre has a significant medieval footprint and a glazed ceramic workshop has been identified, it could also be possible that a workshop within the area was involved in the hitherto unknown production of sugar pots for the locality of Paphos. The context of this building and its related sugar pottery will be discussed, in relation to Paphos and its extended sugar producing areas, with the view to try and determine its purpose.

3 A SWEET ISLAND: SUGAR PRODUCTION AND CERAMIC MANUFACTURE IN 11TH-16TH CENTURIES AD IN SICILY

Author(s): Mentésana, Roberta - Buxeda i Garrigós, Jaume (Dept. d'Història i Arqueologia, Universitat de Barcelona) - Kilikoglou, Vassilis (Institute of Nanoscience and Nanotechnology, N.C.S.R. Demokritos) - Madrid i Fernández, Marisol (Dept. d'Història i Arqueologia, Universitat de Barcelona) - Hein, Anno (Institute of Nanoscience and Nanotechnology, N.C.S.R. Demokritos) - Montana, Giuseppe (DiStEM, Università di Palermo)

Presentation Format: Oral

Sugar production and consumption followed the Islamic expansion in the western Mediterranean and had a huge impact on European social, cultural and economic development since medieval times. The introduction of sugar cultivation entailed knowledge transfer and new technological requirements, such as the manufacture of sugar pots, used for the crystallization of the sugar, which require specific design, thermal and mechanical properties.

The SpotEu project, funded under the Marie Skłodowska-Curie actions, explores the development and impact of sugar production in western Europe through the study of sugar pot manufacture from an interdisciplinary perspective, integrating archaeological and historical research with material science and material culture approaches in an innovative way. Sugar pots are assessed on a morphological, technological and performance point of view aided by instrumental analysis and software modelling. The comparison with reference ceramic materials and written records allows the investigation of the scale of ceramic production and

exchange networks, as well as potters' technological choices in the construction of these on-purpose vessels.

This paper focuses on sugar pots from Sicily, one of the main regions for sugar production in western Europe in the 11th-16th centuries AD. First archaeological and analytical results are presented, revealing different centres of sugar pots production on the island as well as specific choices in the design of the vessels and its properties. This will offer the opportunity to shed light on how craftspeople adapt or transformed their ceramic making traditions in order to face the new product demands from the sugar production industry.

4 **PUERTO DE PALOS (HUELVA, SPAIN), A POTTERY PRODUCTION CENTRE FROM THE 15TH-16TH CENTURIES AD**

Author(s): Coso Alvarez, Júlia - Buxeda i Garrigós, Jaume - Madrid i Fernández, Marisol (Universitat de Barcelona) - Fernández Sutilo, Lucía - Lobo Arteaga, Elena (Huelva University)

Presentation Format: Oral

Puerto de Palos was a natural port on the inlet bank of the Tinto River, on the Atlantic south coast of the Iberian Peninsula. The excavation has recovered the *alota*, i.e., a large building usually present in medieval ports that was used as customs and for port transactions. This 600 m² building was divided into three parts: the tavern, the storehouse, and the inn. Moreover, the building had a chamber where the pottery workshop was placed. Besides the *alota*, there is a well, remains of other walls and pavements, up to 40 pottery dumps, and a group of 90 sugar cones ready for use.

The workshop included at least 12 kilns, but there is evidence for the existence of five more. One of these kilns is to cook food, and another one is a lime kiln. Two big kilns, up to 4.4 m in height, were used for building materials. The kilns and pottery dumps cover a total area of 800-1000 m², and it can be considered the best-preserved pottery production center in Europe for the 15th-16th centuries AD.

Fifty ceramics of different types (sugar cones, coarse wares, cooking wares, transport jars, glazed wares, and majolica) have been characterized by a set of complementary techniques (X-ray fluorescence, X-ray diffraction and scanning electron microscope). The results have enabled to define the reference groups and to identify the production techniques used for each ceramic class. Thus, this study enables to compare the technical aspects that sugar cones share with other ceramic classes, but also the differences due to the constraints imposed by their performance characteristics.

5 **SWEET SALTY WATER: SUGAR MOULDS REMAINS FROM PORTUGUESE ARCHAEOLOGICAL CONTEXTS (15TH - 18TH CENTURIES)**

Author(s): Teixeira, Andre (NOVA FCSH) - Pinto Coelho, Inês - Ferreira, Sara (CHAM-NOVA FCSH)

Presentation Format: Oral

The sugar production was the great promoter of the Portuguese colonization in the Atlantic. The socio-economic model successfully used in the islands of Madeira and São Tomé e Príncipe, and later in Brazil, inspired other colonial processes in America. The sugar trade activity and the introduction of this product into the European diet and pharmacopeia, raised a high volume of exports that linked the Atlantic.

The increasing number of archaeological works carried out in the Portuguese territory allowed to gather several ceramic forms, such as sugar moulds, whose functions were directly related to the sugar manufacture. It seems clear that Portugal maintained an intense production of these objects to fill the needs of their colonial regions, since there was a scarce production in the Iberian peninsula. We highlight the studies developed in Madeira, a sugar mould receiving centre, but above all the Lisbon and Aveiro pottery workshops that provide an important volume of archaeological data that needs to be systematized.

6 **SUGAR PRODUCTION AT AGAETE FACTORY (GRAN CANARIA, 16TH CENTURY AD): THE ARCHAEOLOGICAL STUDY OF THE SUGAR CONES**

Author(s): Buxeda i Garrigós, Jaume - Madrid i Fernández, Marisol (Universitat de Barcelona) - del Pino Curbelo, Miguel (Universitat d'Alacant) - del Cristo González Marrero, María (Universidad de Las Palmas de Gran Canaria) - Barroso Cruz, Valentín - Marrero Quevedo, Consuelo (Arqueocanaria S.L.)

Presentation Format: Oral

Sugar cane cultivation was part of the colonial society, and one of the economic bases of the Castilian expansion through the Atlantic Ocean. Its dissemination influenced the development of new ceramic production patterns in order to supply this industry in colonized territories. Moreover, contrary to what happens with glazed ceramics, industrial pottery was probably produced in local workshops, creating new production structures in the colonies, affecting the previous social indigenous relationships, and creating new ones characteristic of the new colonial model.

This research is part of the TecnoColonial project and focuses on the study of those new production structures that appeared on the island of Gran Canaria during the 16th century. After a first phase with the analysis of 19 sugar cone samples, this second phase includes more sugar cones, but also other ceramics recovered at the site. All materials have been characterized by a set of complementary techniques (X-ray fluorescence, X-ray diffraction, scanning electron microscope, optical microscopy), and the results have been compared with indigenous pottery and with pottery produced in the Iberian Peninsula. The results show the existence of different fabrics among those sugar cones, including calcareous pastes clearly imported, along with low calcareous

groups, some of them of certainly local origin. Moreover, technical differences have been found related to grain size and firing temperatures, possibly caused by different production techniques (the introduction of potter's wheel) and firing structures (the introduction of kilns). Thus, the results show the creation of new products and consumption patterns associated with the colonial process, with the establishment of new workshops, where new production techniques were used.

241 LET THE LEAD CLOTH SEALS SPEAK – THE PRODUCTION, TRADE AND CONSUMPTION OF CLOTH IN MEDIEVAL AND EARLY MODERN EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Haggren, Georg (Archaeology, Department of Cultures, University of Helsinki) - Huang, Angela (Research Centre for Hanse and Baltic History - FGH0 at the European Hansemuseum, Lübeck) - Linaa, Jette (Department of Archaeology, Moesgaard Museum) - Russow, Erki (Institute of History, Archaeology and Art History, School of Humanities, Tallinn University)

Format: Regular session

Cloth was one of the most important traded items in the pre-modern era. Written records testify to the extraordinary role of this commodity and consumption article. Sources allow us to track textiles from their production via distribution centres to consumption sites and speak of vast varieties of cloth and immense profits. The omnipresence in historical sources, however, is unfortunately rarely matched by archaeological records. After a few hundreds of years, cloth only survives in exceptional conditions. In addition to that, taphonomic processes have reduced most of the once colourful and precious cloth to anonymous small fragments. It is therefore extremely difficult to reconstruct the biography of the cloth in question.

Luckily, the archaeological record consists of other finds which offer great potential when analysing the production, trade and consumption of cloth: the lead cloth seal. However, we lack an analysis of these finds on the European level.

Attached to bales of cloth, lead seals followed the cloth from production areas to the retailers in urban or rural sites. Compared to their original quantity though, the number of the surviving cloth seals is few. However, there are very few other archaeological finds that offer more potential than lead cloth seals when analysing pre-modern trade. Cloth seals connect the producer and consumer, they show market relationships and distribution patterns and they allow us to reconstruct the markets for textiles over the centuries. These inconspicuous objects hold a wealth of information, especially if related to written evidence.

This session aims to bring together papers on production, trade and consumption of cloth with lead cloth seals as the starting point. The papers will demonstrate the potential of a larger-scale, interdisciplinary discussion of cloth seals on a European level and will exemplify the contributions of such analyses to the economic history of the pre-modern world.

ABSTRACTS

1 TRACING CLOTH SEALS FROM HANSE TOWN TEXTILE PRODUCTION TO NORTHERN MARKETS

Author(s): Huang, Angela (Research Centre for Hanse and Baltic History, European Hansemuseum Lübeck)

Presentation Format: Oral

This paper wants to explore the use of cloth seals for the study of northern European textile trade by analysing selected examples from Hanse towns. Cloth seals are valuable evidence on the distribution of commercially produced and marketed textiles on European markets in the premodern period. They have great potential for the study of (changing) market compositions as they allow us insights into the different brands and types of textiles traded to a given market in a given period.

This paper is particularly dedicated to relating cloth seals issued at Hanse towns to qualitative and quantitative written records, such as namely the production statutes that often describe the cloth seals associated with a certain product. The production records thus link cloth seals to certain production standards and, at times, inform us about the production process. As guilds often produced different types of cloth identified with different seals, relating both sources more closely offers a better understanding of textile markets. Customs and other accounts furthermore attach value to the cloth certified with the cloth seals. As will be exemplified in this paper using evidence from the Hanse area, in combination, this written and archaeological evidence offers a more differentiated view on northern European textile markets.

2 CLOTH TRADE IN LATE MEDIEVAL TALLINN: WRITTEN VS ARCHAEOLOGICAL EVIDENCE

Author(s): Russow, Erki (Tallinn University, Institute of History, Archaeology and Art History)

Presentation Format: Oral

The hanseatic town of Tallinn has excellent collection of written sources concerning 15th-16th century trade relations, from personal level to much broader issues. Among other issues there is also good datasets on late medieval and early modern cloth trade, including even samples of textile attached to the merchants account books.

Yet the other facet of this topic - physical evidence in a form of archaeological finds from urban archaeological excavations in the walled town of Tallinn and its suburbs - has been until very recently rather modest. Textile survives in Tallinn only in a very rare occasions and even the number of cloth seals was up to 2017 almost non-existent, that is less than 10 items.

This has changed drastically with one site, excavated between Spring 2018 and early Spring 2019: suburban town block at Jahu / Väike-Patarei St. This site revealed more than 20.000 artefacts of what the majority has been closely dated between the 2nd

quarter of 15th and late 15th century. This collection, currently interpreted as a late medieval landfill reflecting the material culture of intra muros plots includes also large amount of finds connected to textile trade. Among other things 75+ late medieval cloth seals have been unearthed thus far (this is still work in progress), giving thus us now a excellent opportunity to compare textual and artefactual evidence of late medieval cloth trade of Tallinn.

The present paper will introduce this new collection of finds as well as attempts to set the artefacts into the broader archaeological and historical framework.

3 CLOTH SEALS FROM THE DROWNED LAND OF ZEELAND (THE NETHERLANDS): RECONSTRUCTING A NORTH SEA TEXTILE TRADE

Author(s): Willemsen, Annemarieke (National Museum of Antiquities, Leiden)

Presentation Format: Oral

In 2018, the National Museum of Antiquities at Leiden (the Netherlands) acquired an old collection of 84 lead cloth seals, found with metal detectors in the so-called Drowned Land of Zeeland in the 1970s and 1980s. The seals were found mostly in the area of the famous drowned village of Nieuwlande and its surroundings, fully lost in the St Felix's flood of 1530, which provides a 'terminus ante quem' for all these seals.

The collection consists of mostly rivet type seals (58) but also bag and bulla type, ranging from 13 tot 42 mm wide. They are decorated with many coats of arms (27), symbols and letters, both stamped and also scratched secondary into the seal. The seals, and thus the cloth, used here in 'Sea-Land', came mostly from cloth centres in southern England, the western Netherlands, Flanders, northern Germany and coastal France, thus indicating a cloth trade centred around the North Sea and most likely determined by waterways.

Various other groups of cloth seals from this area, held for instance by the Stichting Cultureel Erfgoed Zeeland in Middelburg, and recent finds like the many seals (and a pair of seal tongs) from the metro excavations at Amsterdam, confirm this maritime orientation of the trade in the Netherlands, but also shows that the signature of every single cloth using place is different.

4 LEAD CLOTH SEALS IN MEDIEVAL AND EARLY MODERN CASTLES

Author(s): Haggren, Georg (University of Helsinki)

Presentation Format: Oral

Although not a common find on medieval and early modern sites, lead cloth seals are an important artefact type. They provide evidence of trade, networks, fashion, the merchants who sold them, the fabric type, and they can also be used for dating. They are found mostly on two types of sites. The most common type of site are medieval urban excavations which has provided the largest quantity of the artefact. The other type of site is less obvious, and not as associated with trade as urban areas, the castle. In Scandinavia, a considerable number of lead cloth seals have been found from excavations at castles, which has increased our knowledge of the cloth industry.

This paper focuses on the evidence of imported cloth in medieval and early modern castles. It will discuss why are cloth seals usually discovered there? What kind of roles did cloth play in the castles? What kinds of networks do the seals indicate? Are they only evidence of trade? Or should we try to find other interpretations? This paper focuses on these questions based both on the archaeological finds and the written record from the castles.

5 FROM RAGS TO RICHES: THE SUPPLY AND CONSUMPTION OF CLOTH IN EARLY MODERN DENMARK C. 1550-1650

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

Presentation Format: Oral

However, a number of written sources add significant insight into the supply, accession and consumption of cloth in Early Modern Denmark. The probate inventories of the city of Elsinore is the most comprehensive body of inventories from any city in Early Modern Denmark. The thousands of records, that is preserved from 1571 onwards, is a unique, but still a virtually unexploited resource for insight into the consumption of cloth. An analysis reveals the worth of the cloth, the types and origins, the origin and contacts of the retailers and traders. Cross-references between the inventories and preserved clothing items from contemporary burials allow us to get insight into the types of cloth and the clothing items produced. However, the significant insight into rich and poor households in the city allows us to see not only fur and velvet but also patched aprons, worn tablecloths and pawned skirts. This paper will thus adress the socio/cultural imprint of the cloth, contextualise the worth of the cloth and lay out a few paths for possible further studies.

6 LEAD CLOTH SEALS FROM 17TH TO 19TH CENTURY NORTHERN FINLAND: FABRICS AND TEXTILE TRADE

Author(s): Lipkin, Sanna (University of Oulu)

Presentation Format: Oral

Some lead cloth seals have been found in various excavations conducted in northern Finland. Few of the seals have been found in rural contexts while others have been found in towns of Oulu and Tornio. Specifically, in this presentation, the lead cloth seals

found in Oulu are examined based on their find contexts. Additionally, it will be evaluated what these lead cloth seals reveal of the textile trade routes to the north, imported fabric types, the origin of the fabrics, and if they correspond with the archaeological textile finds excavated in Oulu Cathedral church yard, or the information gained concerning the fabric types mentioned in probate inventories. The most intriguing fact is that inside some of the lead cloth seals remains of actual fibers or pseudomorphs have been found. These prove that inspecting the seals for fibers or pseudomorphs before conservation is crucial. These tiny remains reveal offhand the type and colours of the fabrics stamped with the seals.

7 CLOTH SEALS IN SWITZERLAND

Author(s): Ackermann, Rahel (Swiss Inventory of Coin Finds)

Presentation Format: Oral

The study of «Swiss Cloth Seals» is at its very beginning. The first items among archaeological finds were published as late as 1970, and their registering among the archaeological finds is still selective or at random. We lack a common terminology and, in some cases, the importance of these items and their potential as a primary source for Late Medieval and Early Modern economic history is still not recognised.

A first overview, covering published lead seal findings in Switzerland, was given in 2016 (Ackermann/Zäch 2016). Since then, more items were published or made accessible. To bring forward this topic, we started, in some cantons, the systematic registry and study of cloth seals and other lead seals. The material at our disposal is manifold. On one side we have findings from archaeological excavations, some in dated context, and from surveys, the cloth seals showing a wide range of tissue imports. On the other side two major production centers in today Switzerland attached cloth seal to their products, the cities of Fribourg with its woolen tissues, and of Saint-Gall with its linnen production. The typology of their cloth seals is yet to be established.

The paper will sum up the current state of research in Switzerland and give a first systematic survey of the local cloth seal findings, allowing then to integrate Switzerland in the European cloth trade network.

Bibliography

Ackermann/Zäch 2016 – R. C. Ackermann/B. Zäch, Plomben, Marken und Zeichen. Schweizer Münzblätter 66, 2016, S. 67–79.

8 THE ARCHAEOLOGY OF LATE MEDIEVAL AND EARLY MODERN TEXTILE TRADE IN HUNGARY

Author(s): Mordovin, Maxim (Eötvös Loránd University)

Presentation Format: Oral

The research of the medieval and early modern cloth trade is a relatively well-studied subject in the Hungarian historiography due to a large amount of available written sources. Several scholars contributed to this topic yet in the 1960s and 1970s, namely György Székely and Zsigmond Pál Pach. At the same time, Lajos Huszár and Walter Endrei evaluated the first, although quite limited groups of available cloth seals. However, the growing number of cloth seals collected during the last couple of decades has provided a significant amount of new data not documented in the archival material. The largest such collection of cloth seals in Hungary datable to the 15th-16th C. was found during rescue excavations in a Western-Hungarian small town of Pápa. The finds are the best indicator of the extensive market activity of the city. Several types of cloth seals are still known only from this excavation, namely Kulmbach, Hof a/d Saale, and Wurzen. These results gave the most important impulse for the research of the cloth seals in the former Kingdom of Hungary. There are about 15 hundred seals that have been recorded in the Carpathian Basin (including Hungary, Slovakia, and parts of Romania and Ukraine).

This paper presents the main types of cloth seals found in Hungary and their provenance including the probable contemporary forgeries.

9 FLEMISH CLOTH SEALS IN THE CITY OF BOLGAR

Author(s): Koval, Vladimir (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Flemish lead cloth seals were found in many places of Eastern Europe, since the Flemish textile was an expensive goods that were traded in all large cities. A lot of seals were found in Novgorod excavations, the former “gateway” of Russia, open for trade with Europe. But much more finds were fixed on the territory of the capital cities of the Golden Horde State in the Lower Volga region. Recently 1 new point of mass finds of Flemish seals appeared on the map of Eastern Europe - this is the city of Bolgar, which was one of largest Eastern Europe cities of in 13-14th cc. During the archaeological excavations of the central market of this city, on an area of about 1000 square meters, 23 seals were found. Seventeen seals were directly connected with the ruins of the central market building dated 1350-1360s, and 6 were found in an earlier context (1340-1350s). Exact dates are based on the findings of about 1000 coins in the layers of destruction of the market and underlying level.

Three seals belonged to the West-Dutch city of Dixmude, one – to the city of Damme (port of the city of Brugge), one – to the city of Tournai (Flemish “Doornik”). Most of the seals do not have an exact attribution, however the seals of the cities Ieper, Lo-Reninge (Belgium) or Aire (France) are supposedly identified.

Judging by the high concentration of seals, the central market of the city of Bolgar would be the center of expensive luxury goods trade, among which Flemish textiles occupied one of the first places.

10 THE LEAD TRADE SEALS IN THE CZECH REPUBLIC

Author(s): Cechura, Martin (The Museum of West Bohemia in Pilsen)

Presentation Format: Oral

The lead trade seals are important artifacts, that document international trade throughout Europe. In the Czech Republic, the evidence and analysis of these artifacts are at very beginning. The paper deals with information about cloth seals research in the Czech Republic, their archaeological context and circumstances of their discovery. While only a small number of seals have been found during archaeological researches, many finds come from using of metal detectors. The oldest known seals in the Czech Republic date back to the 14th century, most of them coming from the 15th to the 18th century. The origin of seals includes most of the well-known business centers, especially Northern and Western Europe. A big collection of seals found during archaeological research in Mikulov will be used as a model example. A great deal of attention is paid to the findings of Czech provenience seals. Seals from the 19th - 20th centuries are also investigated and the international trade in grain and flour is particularly interesting here.

243 TIMES OF CHANGE: LATE NEOLITHIC LIFESTYLE AND POPULATION DYNAMICS IN CENTRAL EUROPE

Theme: Global change and archaeology

Organisers: Siebke, Inga (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena) - Lösch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Steuri, Noah (Department of Prehistory, Institute of Archaeological Sciences, University of Bern)

Format: Regular session

Despite the large amount of interdisciplinary projects on the Neolithic to Bronze Age transition involving bioarchaeological research, it seems difficult to reconstruct the processes that lead to major cultural and demographic changes in Central Europe in the 3rd millennium BCE. With continuous improvements of analytical methods, the amount of data is constantly growing and by combining results from different disciplines, a more comprehensive synthesis can be acquired.

Our session aims to bring together specialist from different disciplines working on Late Neolithic and early Bronze Age material to increase our understanding of the transformative processes that shaped this period. We want to provide a platform for discussions to obtain a bigger picture and state-of-the-art knowledge about lifestyle and population dynamics of the Late Neolithic and early Bronze Age in Central Europe.

We welcome contributors who work on Late Neolithic material from Central Europe and focus on one or more of the following aspects with regard to osteological remains, isotope analysis, aDNA, population dynamics, radiocarbon dating, land use, paleopathology, palaeobotany, zooarchaeology, grave goods, case studies, and new bioarchaeology methods.

ABSTRACTS

1 LIFESTYLE OF LATE NEOLITHIC POPULATION IN LAKE LUBĀNS WETLAND

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Presentation Format: Oral

The Lake Lubāns wetland population's lifestyle during the late Neolithic and partly the beginning of Bronze age can be characterized by material obtained at Abora, Asne, Eiņi, Iča un Lagaža settlements.

The population of the Lake Lubāns wetland at the late Neolithic experienced a partial inflow of corded ware culture in all of the aforementioned settlements, where it was represented both by Thuringian amphorae and the A-type axe, but also by the pottery types of later development phases of this culture.

The late Neolithic economy was based on the use of local resources – the abundance of freshwater fish and hunting fauna, however, also sustaining care for a small number of livestock (cattle, sheep/goat). The late Neolithic period saw the flourishing of portable art – anthropomorphic sculptures made of horn, figurines of adders and grass snakes cut in bone, as well as the creation of personal bone adornments – pendants, discs and lunulae (Abora).

Particular attention should also be paid to the use of ornaments, signs and engravings, as well as the application of cuts on horn axes and hunting daggers (Iča).

Paleo-osteological studies conducted allow to trace the content of the late Neolithic hunting trophies (terrestrial and avian fauna, ichthyofauna), placing in the foreground wild boar and elk as the main hunting objects. The most recent studies are directly related to Iča settlement, where 15 mammal species are represented, of these 7 are predators.

Lubāns Stone Age seed flora was studied, establishing the presence of *Salvinia natans* megaspores.

On the basis of elaborated transgression and regression phases of the Lake Lubāns, the Lake Lubāns development model has been elaborated. The results of investigation into the vegetation history mark the actual start of cereals' introduction at the Subboreal period.

2 **CORDED WARE CULTURE FROM SOUTH-EASTERN POLAND IN THE LIGHT OF ISOTOPIC ANALYSIS**

Author(s): Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow; Department of Anatomy, Jagiellonian University Medical College, Cracow) - Jarosz, Paweł (Institute of Archaeology, Adam Mickiewicz University, Poznań) - Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow)

Presentation Format: Oral

The aim of our study is to present the result of stable isotopes analysis of the Final Neolithic communities of the Corded Ware culture from south-eastern Poland. Conducted investigations enabled for the diet reconstruction and tracing variability in the nutrition preferences within and between territorial groups.

We analysed samples of human and animal bones. Extracted collagen was firstly dated and then stable isotopic composition was determined using a Thermo Flash EA 1112HT elemental analyzer connected to a Thermo Delta V Advantage isotope ratio mass spectrometer in a Continuous Flow system.

Generally there were no significant sex differences in dietary intakes but a group of male individuals with higher $\delta^{15}\text{N}$ values is noticeable. Signatures of human $\delta^{13}\text{C}$ ranged around -20‰ so they are typical for humans living in inland temperate environments and having a terrestrial diet based on C3-plant and animal resources. The $\delta^{15}\text{N}$ values are from about 10 to 11.4 ‰ and they are comparable with contemporary populations from the central Europe. The offset of +3–4 ‰ in human $\delta^{15}\text{N}$ values in comparison to herbivores and the omnivore animals corresponds to a difference of one trophic level. Acquired results of stable isotope analysis are consistent with models of subsistent strategies of the Corded Ware culture communities based on archaeological sources.

The project is currently realized (National Science Centre, Poland, NCN 2015/19/B/HS3/02149 and 2016/20/S/HS3/00307).

3 **STABLE ISOTOPE ANALYSES OF LATE NEOLITHIC HUMAN REMAINS FROM SWITZERLAND**

Author(s): Siebke, Inga (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Steuri, Noah (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Furtwängler, Anja (Institute for Archaeological Sciences, Archaeo- and Palaeogenetics, University of Tübingen) - Hafner, Albert (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Ramstein, Marianne (Archaeological Service Bern) - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena) - Lösch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern)

Presentation Format: Oral

Stable isotope studies of human remains from the Late Neolithic of modern Switzerland are currently absent from data sets of Central Europe. This changed with the discovery of the Dolmen from Oberbipp, which forms the basis of a project to reconstruct nutrition and mobility during the Late Neolithic using stable isotopes ($^{13}\text{C}/^{12}\text{C}$, $^{15}\text{N}/^{14}\text{N}$, and $^{34}\text{S}/^{32}\text{S}$) as well as occupation time, kinship and population genetics. This paper is aimed to evaluate diet with regard to sex, geographical regions, and chronological phases.

In total, 114 human skeletons from 20 different sites (Switzerland, France, and Germany) were sampled. All samples were radiocarbon dated and date from the Middle Neolithic to the Early Bronze Age. In addition, 67 contemporary faunal remains were sampled. Collagen was extracted and its quality was assessed.

All faunal remains and 91 human samples from 14 sites provided sufficient collagen quality for subsequent statistical analyses. The data show expected trophic levels for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$. The human samples show little variation for $\delta^{13}\text{C}$ between sites, while $\delta^{15}\text{N}$ and $\delta^{34}\text{S}$ show greater variability. No differences between the sexes regarding all three elements are observed. However, little distinction between the chronological phases are recorded.

The small variability for $\delta^{34}\text{S}$ across the animals is indicative for a local signal and therefore suitable as baseline for the human samples. The $\delta^{13}\text{C}$ values indicate a C3 plant based diet across all sites, which is consistence with other contemporary sites from Central Europe. The variability of $\delta^{15}\text{N}$ seems to be related to the site rather than being indicative for the social status. The sulphur values do not support the hypothesis of either patrilocality or matrilocality. However, the females have a larger distribution than the males, which could be an indication towards higher female migration.

4 GENETIC TRANSITION IN THE SWISS LATE NEOLITHIC AND EARLY BRONZE AGE

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Presentation Format: Oral

Major genetic changes in European populations occurred at the beginning as well as final stages of the Neolithic period as shown by recent genetic studies. The transition from hunter-gatherers to agriculturalists and farmers in the 6th millennium BCE coincided with a human migration from the Near East. A second migration into Central Europe occurred originating from the Pontic steppe in the 3rd millennium BCE and was linked to the spread of the Corded Ware Culture which ranged as far southwest as modern day Western Switzerland. These genetic processes are well studied, for example for the Middle-Elbe-Saale region in Germany, however, little is known from the regions that connect Central and Southern Europe.

In this study, we investigate genome-wide data from 97 individuals from the Swiss Plateau, Southern Germany and the Alsace Region in France that span the transition from the Neolithic to the Bronze Age (3500 to 2000 BCE). Our results show a similar genetic process as reported for the Middle-Elbe-Saale region suggesting that the migration from the Pontic steppe reached all the way into the Swiss Plateau. However, our evidence suggests that the onset of that transition may have started even earlier in Switzerland compared to the Middle-Elbe-Saale region.

5 RADIOCARBON DATING OF HUMAN REMAINS FROM THE LATE NEOLITHIC DOLMEN OF OBERBIPP (SWITZERLAND). CLARIFYING THE CHRONOLOGY AND SEQUENCES OF BURIALS

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Presentation Format: Oral

Undisturbed collective megalithic burials are extremely rare. The dolmen of Oberbipp provides a unique opportunity for multidisciplinary research. Morphological analysis indicate at least 42 individuals buried in the grave chamber. Using archaeology alone it was not possible to determine different occupation periods of the inhumations. Neolithic communities often reused dolmen over centuries, therefore radiocarbon dating might be able to solve this question. Fragments of the same bone element (right femora) were analyzed by two (in some cases three) different laboratories to date all inhumations individually.

This study had three aims: a) determine the total occupation time of the dolmen; b) evaluate the sequence of the burials; c) compare the results of the same skeletal element from different laboratories.

In total, 79 radiocarbon results from three different laboratories of the right femora (n=32) are available. The broad application of radiocarbon dating allowed the determination of two occupation periods within the burial: The majority of the femora (n=26) date between 3350-2950BCE, but three samples are from a younger period (2900-2650BCE). The comparison between radiocarbon dates obtained in different laboratories for the same sample showed little variation and only a few samples differed substantially.

Our sampling strategy indicates the necessity for archaeological settings such as multiple burials to include large serial radiocarbon measurements to ensure that all occupation phases are uncovered. In addition, our data indicate that dating at different laboratories should be included in the sampling process to guarantee that the interpretation is based on the best available data. Even though the overall concordance across the laboratories was good, little variation could lead to a different interpretation of a site. In future it should also be considered to include other bioarchaeological methods such as aDNA analysis in combination with radiocarbon dating to overcome problems related to plateaus of the calibration curve.

WHAT IS A VILLAGE? CHALLENGING CONCEPTS AND METHODS OF IRON AGE AND MEDIEVAL VILLAGES, HAMLETS AND SINGLE SETTLEMENTS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Ødegaard, Marie - Gjerpe, Lars Erik (Museum of Cultural History, University of Oslo) - Jessen, Mads (The National Museum of Denmark)

Format: Regular session

Villages, nucleated settlements and single farms co-existed in the Iron Age and medieval times. The question of what is a village has been widely discussed within geographical, historical, archaeological, and anthropological research. Definitions are often related to the numbers of farms/buildings and spatial properties of farmsteads. Judicial and social rights/aspects such as land ownership, tenure and land use as well as the interdependency between the farmsteads and/or formal institutions as churches or schools has also been considered.

The question become more complicated when we consider different temporal scales and geographical regions; can we apply the same concept of a village for England's Pre-Roman Iron Age as in Sweden's Middle Ages? The application of methods, such as Bayesian modelling of radiocarbon dates or GIS-analysis may provide sequences of concurrent houses as well as life duration of separate houses on a site and insight into the spatial lay-out of a site. This may provide new answers to old questions: What is a village and why did someone choose to live in a village? It also opens for new questions related to the biography of the settlement and the inhabitants.

For this session, we invite contributions that examine archaeological case studies presenting current research on the Iron Age and medieval settlement patterns and the infrastructure of farmsteads and villages across Europe. We especially welcome studies who challenge concepts and methods of different settlement structure and landscape organization. We hope for contributions presenting both theoretical as well as empirical cases.

ABSTRACTS

1 INTRODUCTION TO "WHAT IS A VILLAGE? CHALLENGING CONCEPTS AND METHODS OF IRON AGE AND MEDIEVAL VILLAGES, HAMLETS AND SINGLE SETTLEMENTS."

Author(s): Ødegaard, Marie (Museum of Cultural History University of Oslo)

Presentation Format: Oral

This paper will give an introduction to the session "What is a village? Challenging concepts and methods of Iron Age and medieval villages, hamlets and single settlements." There has been a common assumption that there did not exist villages in Norway, while Denmark and southern Sweden are well known for their villages going back to the Bronze Age. Archaeological investigations does however indicate villages and nucleated settlements also in Norway, in addition to single farms. We thus need to think new about the settlement pattern. Why did someone choose to live in a village? Was it because of differences in ownership to land, or was it a desire of communion and safety that made people wanting to live close together?

The term village has been widely discussed within geographical, historical, archaeological, and anthropological research. Definitions are often related to the numbers of farms/buildings and spatial properties of farmsteads. Judicial and social rights/aspects such as land ownership, tenure and land use as well as the interdependency between the farmsteads and/or formal institutions as churches or schools has also been considered. The question become more complicated when we consider different temporal scales and geographical regions. The paper will discuss some aspects related to different terminologies and question the different concepts and methods of different settlement structure and landscape organization.

2 ON THE CHRONOLOGICAL MARGIN: A BRONZE AGE VILLAGE AT KEHRSATZ, BREITENACHER (SWITZERLAND)

Author(s): Mamin, Yann - Prétôt, Laure (Service archéologique du canton de Berne)

Presentation Format: Oral

From 2015 to 2018, a settlement dating to the mid/early late Bronze Age was excavated in Kehrsatz, a few kilometres from Bern (Switzerland). The results of the 15'000 m² excavation are in the process of being analysed. Several dozen building plans can be reconstructed. De-spite the inherently poor preservation on such dry land sites, several tens of thousands of pottery sherds combined with dated charcoal samples from post-holes should allow a chrono-spatial analysis of the excavated part of the site.

Only 500 m to the north, another collection of excavated buildings fall within the same chronological range, suggesting one single settlement existed with a length of more than 800 m (10 ha or more).

Questions into the nature of villages in general relate to Kehrsatz twofold:

- If the site is single-phased, the village has a defined area and period of use.
- If however, the on-going analysis shows a diachronic occupation, the site attains a different character: one of coexisting scattered groups of buildings with perhaps more than one nucleus of settlement/agricultural activity.

It is thus the question of the definition of a village that can be investigated in Kehrsatz on a local scale thinking about reasons of

settlement in this location and a regional scale relating to other sites.

In addition, the markedly different spatial organisation of the densely packed and apparently planned lakeside villages of the Early and Late Bronze Age of the Swiss Plateau compared to the more loosely occupied dry land sites such as Kehrsatz is worth exploring. Is it a functional, a cultural or a historical phenomenon?

While at the chronological margins of this session, this contribution will consider the notion of the “village” in a context that does not provide as precise data as the well-known lakeside settlements that predate and follow them.

3 BRONZE AGE COMMUNITIES OF THE RUSSIAN STEPPES: RECONSTRUCTIONS BASED ON DISTANCE-INTERACTION PRINCIPLES

Author(s): Sharapov, Denis (Tyumen State University)

Presentation Format: Oral

This presentation discusses an approach to regional settlement pattern analysis that supersedes the labels of ‘village’, ‘hamlet’, ‘town’, and even ‘archaeological site’. All of the above definitions are problematic due to their subjectivity and the resulting difficulty when it comes to using settlement types as analytical units in comparative studies. In order to overcome this issue, a number of archaeologists have been outlining communities based on a quantitative procedure that measures the intensity of human interaction across a landscape (Peterson and Drennan 2005). Firstly, local communities are outlined based on Murdock’s (1949) classical definition of ‘community’ – a group of people that interact face-to-face on a virtually daily basis. Secondly, supra-local communities are outlined as distinct clusters of smaller local communities, inside of which people interact more intensely than outside. Methodologically, communities are outlined by selecting appropriate isolines on a raster surface that reflects continuous interpolated values of population density in a given region. IDW-interpolated population densities are taken to reflect the intensity of human interaction. My presentation illustrates how this methodology was used to analyze the processes of long-term social change in the southern Urals region of Russia during the Bronze Age period (2100-1400 BC). Among other things, we found that some local communities (or “villages”) had a peculiar spatial layout. In particular, they consisted of a few occupation clusters located a considerable distance (80-150 m) apart. I believe such a layout was conditioned by the demands of an extensive pastoral economy, which required large amounts of space for the keeping of domestic animals.

4 IT TAKES A VILLAGE...? SETTLEMENT STRUCTURE AND LANDSCAPE USE IN SOUTHWEST NORWAY IN THE LAST MILLENNIUM BC

Author(s): Meling, Trond (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

Due to the use of mechanical topsoil stripping as a frequent survey and excavation method since the early 1990s, a large number of agricultural settlements from the Late Bronze Age and Pre-Roman Iron Age have been recorded in Rogaland, Southwest Norway. It seems that this was a period where established farm areas expanded and new land was cleared to facilitate farming, grazing and the construction of settlements. In some areas, the settlement had a village or hamlet like structure in the Pre-Roman Iron Age, but in general, single farms dominate. From this period, we also have a large number of single or small clusters of cooking pits scattered in the meadows and outfield areas nearby the settlements. Such structures are rarely accounted for when discussing farms and farm organisation, but they indicate that the settlement expansion also resulted in an increased, and perhaps new, use of the surrounding landscape.

In this paper, I will discuss the settlement pattern and organization of farms in Rogaland during the Late Bronze Age and Pre-Roman Iron Age, based on a collocation of all radiocarbon dates from this period. The number of excavations and surveys are not equally distributed throughout the county, but even so, the data reveals both variations and similarities between different landscapes and regions within Rogaland. Put together, the data gives information about the intensity and form of settlements, how single and clusters of farms were organized, and how settlements were situated in the landscape. The data also reveals how the surrounding landscape was an important resource and an integrated part of the farm structure.

5 THE FOUNDING OF THE EARLIEST VILLAGES IN SOUTHERN SCANDINAVIA

Author(s): Haue, Niels (Historical Museum of Northern Jutland)

Presentation Format: Oral

A case study from Northern Jutland, Denmark presenting current research on the Early Iron Age settlement patterns. At the transition between the Bronze Age and the Iron Age a shift in settlement patterns can be observed in the northern parts of Jutland, Denmark. Large villages with 10 or more concurrent farmsteads suddenly emerges, showing no gradual development from the single-farms that dominated during the Bronze Age. So why did people choose to live in a village? This paper will discuss some of the interpretations that has been presented so far. Did the changes arise out of climatic, ecological or demographic reasons or should the emergence of villages be associated with a more violent period with raids and plunders? Furthermore, the changes within settlement structure must have influenced the landscape organization, or perhaps vice versa.

Did the shift in settlement pattern result in more fundamental changes within the society? Analysis of the spatial layout of the sites does indicate that an increase in hierarchization is observable. The hierarchization cannot be seen in the burial data of the period of interest, and only large-scale settlement excavation enables us to recognise these differences that challenges the narrative of Early Iron Age Scandinavia.

6 THE DEEP HISTORY OF SINGLE FARMS IN ØRLAND, NORWAY

Author(s): Ystgaard, Ingrid (NTNU University Museum)

Presentation Format: Oral

Ørland is a peninsula on the Norwegian coast, strategically positioned at the important crossroads of the coastal naval route and the naval route to the inland via the Trondheim fjord.

In 2015 and 2016 an area of 110 000 m² of cultivated land at Vik, Ørland was excavated due to the enlargement of the Norwegian main Air Base, revealing traces of eight Iron Age farmsteads. The flat land rose from the sea around 2600 BP +/- 100 years. Indications are that the land was divided into fairly equally sized plots very soon after the peninsula was inhabitable around 400 BC. During the course of the Early Iron Age (c. 500 BC – AD 575) no major changes in the distribution of land occurred. Instead, the division of land from c. 400 BC remained the basic idea. The settlement declined from c. AD 350, and vanished completely around AD 575.

Situated in a coastal environment, people in Ørland were probably in touch with settlements along the Norwegian and Danish coasts, where nucleated settlements and villages from the same period occurred. However, an idea of a village did not transfer to Ørland. Farms remained separate, even when situated as close as 150 m apart. Still, the outfields might have remained a common economic resource. Indications are also that farms specialized their production in the Roman Iron Age and thus perhaps took part in a larger, economic cooperation.

7 DILLING – AN EARLY IRON AGE VILLAGE IN SE NORWAY?

Author(s): Winther, Torgeir - Johannessen, Linnea (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

The rather late introduction of mechanical topsoil stripping in Norwegian contract archaeology in the 1980's marks the start of a veritable golden age for the study of prehistoric settlements in Norway. In combination with an explosive growth in excavation activity, this created a massive increase in the number of recorded Iron Age buildings, particularly from the early Iron Age (500 BCE–500 CE). Despite this, no settlements larger than a single farm have been found in SE Norway, and the general picture has been that of a dispersed settlement characterized by single farms dotting the landscape.

The recently finished excavations at Dilling in Rygge, Østfold municipality, stands in stark contrast to this established pattern. For the first time a large, contiguous settlement has been excavated in SE Norway. Here, over 130 buildings largely dating to the period 200 BCE–200 CE was recorded within an area of 7 hectares. The internal organization within the site suggests that it consisted of at least six or seven closely clustered farms. Although no remains of formalized boundaries were found, the excavation results suggest that each farm had a separate plot for small scale cultivation and cooking pits close to the farmstead.

When compared to the existing data from the region, the sheer scale and density of the finds at Dilling makes it clear that this represents a distinctly different type of settlement. However, the site differs quite significantly from the neatly ordered villages found in South Scandinavia in this period. The results from Dilling thus prompts us to reevaluate not only what we know of the settlement patterns in SE Norway in the early Iron Age, but also the applicability of the existing settlement terminology in a regional context.

8 AN ABSENCE OF VILLAGE COMMUNITIES IN EASTERN DENMARK DURING THE IRON AGES?

Author(s): Villumsen, Sune (Museum Sydøstdanmark)

Presentation Format: Oral

Working within the field of contract archaeology on Zealand in Eastern Denmark, we are dealing with a long established truth about the absence of village communities in this part of the country during the Iron Ages. The traditional view of the settlement structure on Zealand has been one of predominantly single farmsteads, whereas village communities known from classic sites such as Hodde, Nørre Snede and Vorbasse has traditionally been regarded as a phenomenon primarily linked to the Jutland Peninsula.

Nevertheless, many new excavations, a wider use and more systematic approach to radiocarbon dating paired with the advents in Bayesian Modelling, has left the old explanations of settlement structures wanting. Simultaneously there has also been a shift in focus from the excavation of a house to the excavation of a community. It is very much a theoretical shift but in practice, this means that excavations now cover significantly larger areas that are stripped of the topsoil, compared to the norm just 5-10 years ago. This has led to the excavation of Iron Age communities that, despite the lack of most of the trademarks of the Jutland *loci classici*, best can be described as villages.

Even so, these new insights and large datasets presents more questions than answers. How should we interpret and define the social structures of these communities and how do we overcome the persisting problem of the still insufficient precision of the radiocarbon-based chronologies? In the presentation, these questions will be further discussed based on cases from recent excavations on eastern Zealand.

- 9** **BAYESIAN CHRONOLOGICAL MODELLING OF RADIOCARBON DATES FROM A LATE IRON AGE/VIKING AGE SETTLEMENT AT ØLSEMAGLE, ZEALAND, DENMARK**
Author(s): Søndergaard, Mathias (Museum Sydøstdanmark)
Presentation Format: Oral
- Ongoing development-led fieldwork has documented a large settlement complex dating from the Early Iron Age and the Late Iron Age/Viking Age around the medieval village of Ølsemagle, Eastern Denmark. Systematic radiocarbon dating of samples from post-built longhouses has established a basic understanding of the intra-site chronology and spatial dynamics of the settlement. Accordingly, it is possible to estimate the timing of some important key events and structural changes within the broader chronological framework.
- This case study will focus on the formation and development of a Late Iron Age/Viking Age settlement on the outskirts of the present day Ølsemagle village. The site chronology indicates a probable hiatus and major relocations of the settlement center of gravity preceding the Viking Age settlement phase. One objective is to determine the dating and duration of the relocated settlement by formal chronological modelling of the radiocarbon dates. Furthermore, the location of a Viking Age settlement phase raises the question of continuities in the settlement structure from the Viking Age to the Early Medieval Period and it may be possible to estimate the timing of some of the processes that formed the structural context of the medieval village community. However, some fundamental uncertainties persist concerning the size and layout of farmsteads, the number of chronologically interrelated farms and the level and tempo of dynamics occurring in the intervals between the defined key events. The presentation will consider approaches and some challenges to the modelling of these phenomena.
- 10** **TO BE OR NOT TO BE A VILLAGE, IS THAT THE QUESTION? VILLAGE AND SETTLEMENT IN SOUTHWESTERN SCANIA AD 400-1800**
Author(s): Schmidt Sabo, Katalin - Söderberg, Bengt (National Historical Museums, The Archaeologists)
Presentation Format: Oral
- The aim of the study was to investigate the concept of village and settlement patterns in a long-term perspective in the southern part of Sweden. Why were people and rural production organized in villages, and who were the actors? For whom were villages a successful concept and was one definition for villages really enough to describe the role villages played in different societies? What links were there between villages and societies? All excavated farmsteads in the period AD 400-1800 were registered in a GIS database that was used for large-scale analysis. Trends in ups and downs in the settlements at different times became visible. Large farm units/estates influenced village formation due to control over land and the ability to organize people and agrarian production. Village nucleation in this region was considered as a precondition for state formation, as it guaranteed a stable and continuous transfer of agrarian surplus through taxes.
- 11** **THE URBAN VILLAGE - CONSIDERATIONS ON THE SIZE, FUNCTION AND DESIGNATION OF GUDME, FUNEN, DENMARK**
Author(s): Jessen, Mads (National Museum of Denmark)
Presentation Format: Oral
- Iron Age Gudme, Funen, Denmark, is renowned for its magnificent hall-buildings, which are among the first and largest in Scandinavia, and seemingly functioned as socio-religious centres. Additionally, the site is characterised by a very large number of individual farmsteads, and at its peak perhaps as many as 50 farms. The sheer number of farms clearly separates Gudme from contemporary villages, which are never composed of more than a fraction of the Gudme farms. Virtually all habitable land was taken, and during its peak the Gudme area could have accommodated a substantial amount of inhabitants – especially so when considering the affiliated landing site at Lundeberg. A further conspicuous feature is the relative absence of a farming economy at the farmsteads. Instead, highly specialised craftsmanship (perhaps trade) can be found in the area and the debris and tools of gold- and silversmiths as well as bronze casting is easily recognisable. Thus, the Gudme situation can in many ways be paralleled with an urban setting, but such a designation has in research been reserved for the later emporia. As such, the paper will discuss the ‘upper limits’ of the concept of a village and the factors that designate urbanity and larger villages.
- 12** **KHAPURA: AN IMPORTANT EARLY SETTLEMENT BETWEEN GHAGHARA AND TONS RIVER IN DISTRICT AMBEDKAR NAGAR, UTTAR PRADESH, INDIA**
Author(s): Singh, Pushp Lata - Shukla, Dipak Kumar (Banaras Hindu University, Varanasi)
Presentation Format: Oral
- The present paper is primarily based on recent archaeological excavation at Khapura lies in between Ghaghara and Tons river in district Ambedkarnagar, Uttar Pradesh, about 50 km away from Ayodhya.
- The ancient mound of Khapura extend over an area of 600×800 m and its height is approx 4 metre from the surrounding ground level. The excavation was conducted under my direction in field season 2017-18. The excavation brought to light two fold cultural sequences ranging from circa 1000 B.C.E. to circa 200 B.C.E. without any break in occupation. The deposit of the earliest habitation belongs to the Pre-Northern Black Polished Ware. The main Ceramic industries of this period are black slipped ware, red ware, black and red ware. The other material remains are carnelian beads, terracotta beads, terracotta disc, wheels, iron objects and bone objects etc. The important aspect is the occurrence of Pre-Northern Black Polished Ware phase with iron from the first

time in this region.

The period II adheres to northern black polished ware culture. The ceramic comprises northern black polished ware, black slipped ware, red ware and grey ware. The evidence of mud floors, hearths and ovens recovered from the excavations. The material remains include semi precious stone beads, terracotta, stone, copper, iron objects and decorated bone arrowheads. A large number of archaeobotanical and archaeozoological remains were collected from the site.

On one hand the material remains of Khapura shows that the ancient settlement had cultural contacts with the settlement of Sarayupar (Ghaghara) region and on the other hand with sites like Rajghat, located on the river Ganges. The location of Khapura is very important as it lies on the trade route from Kashi (Rajghat) to Koshal (Ayodhya).

13 THE EARLY MEDIEVAL SETTLEMENT PATTERN IN THE MASURIAN LAKELAND. CASE STUDIES OF THE PRUSSIAN MICRO-REGION OF STAŚWINY VILLAGE (NE POLAND)

Author(s): Karczewska, Malgorzata (Centre for Middle Eastern European Studies) - Karczewski, Maciej (University in Białystok) - Pluskowski, Aleks (Department of Archaeology, University of Reading)

Presentation Format: Oral

In the Middle Ages the area that is today north-eastern Poland was the part of the tribal territories of Prussian - West Baltic communities. Thanks to the medieval written sources it is known that the settlement network at that time, in this area, consisted of two main elements: small village settlements, called lauks, and hillforts. Lauks was not just a small village. It consisted of a few single farms, which together formed a settlement micro-region. Until now archaeological investigations on this category of Prussian settlement landscape were very limited. One of the exceptions is the area of modern Staświny village, located in the Masurian Lakeland. Most probably it was founded, shortly after the conquest of the Teutonic Order, on the basis of a Prussian lauks in the context of the conquered Galindia tribal territory.

The archaeological investigations of the lauks Staświny, conducted so far, have been multi-disciplinary, including both invasive and non-invasive archaeological methods, geophysical survey, as well as palynological, palaeobotanical, archaeozoological, archaeoichtiological, geological, geomorphological, palaeohydrological analyses and historical background studies. In effect, a holistic reconstruction of the environmental context of the early medieval settlement micro-region was obtained. Together with the results of archaeological excavations and non-invasive methods it enabled the reconstruction of the early medieval cultural landscape of the settlement micro-region, as well as the main patterns of occupation by its residents.

14 ORGANIZED PLANNING OR MERE COINCIDENCE? A CASE STUDY OF VILLAGE, FARM AND BOUNDARIES IN JUTLAND, DENMARK IN THE MIDDLE AGES

Author(s): Søndergaard, Louise (Museum Skanderborg) - Hartvig, Anders (Museum Sønderjylland)

Presentation Format: Oral

The aim of this paper is to examine patterns and development of the topographical locations of villages and single farms throughout the middle Age. Are significant sociological and political changes recognizable in the pattern of topography, or in peoples desires to live secluded or to be a part of a community? The common thesis rests on the belief that the building of masonry churches in the 12th century made the people – and thus the villages – stationary. Is that image recognizable in the excavated material? How are the natural boundaries used in different periods and how does the medieval settlements relate to possible nearby Iron Age settlements? Did the needs of the Iron Age farmer correlate to those living of the land 1000 years later?

In the southernmost part of Denmark the excavated material is vast, well documented and well dated. In this paper we use this area as guideline and examine whether that regional pattern reflects itself as one moves further north into Jutland.

15 DEVELOPMENT OF MEDIEVAL VILLAGES IN SOUTHERN FINLAND

Author(s): Heinonen, Tuuli (University of Helsinki)

Presentation Format: Oral

In the late Middle Ages, the coastal area of Uusimaa, Southern Finland, was characterized by small villages and hamlets inhabited by Swedish-speaking peasants. These villages have been thought to have been founded by Swedish peasants during a period between late 12th and mid-14th century, when a large number of people moved from mainland Sweden to Uusimaa. Based on place name evidence, before this a scattered Finnish settlement was spread out in the area, but the extent and organization of this earlier settlement, as well as its relationship to the newcomers, are poorly known and have often been considered insignificant.

The idea of a structured village landscape developed by early Swedish immigrants has been mainly based on later historical sources, especially 17th and 18th century maps. However, the idea of these organized villages with several farms located on a structured plot dating back to early Middle Ages has been questioned by recent archaeological research. A new picture of how the villages in the area were founded and how they developed through time has emerged. The archaeological excavations have shown that the villages have their origins in small settlements with both Swedish and Finnish speakers active in the village formation process. The late medieval villages with a structured layout were only the result of a long development. In this paper, this development is discussed with examples from several archaeologically excavated village sites in the area.

16 **WOULD SINGLE FARMS BUILD A CHURCH? TRYING TO TRACE CHANGES IN SETTLEMENT PATTERNS THROUGH INCOMPLETE DATA**

Author(s): Lindell, Satu (Museum of Archaeology, Stavanger University)

Presentation Format: Oral

Summer 2018, the archaeological museum of Stavanger excavated a large site in Madla, close to the medieval city of Stavanger on southwest coast of Norway. Few years earlier the county archaeologists conducted extensive surveys and preliminary excavations on the site and its surrounding areas. The 14C-datings taken from the site cover all periods from Neolithic to medieval times.

During the excavation in 2018, larger areas clustered with postholes and cooking pits were uncovered, along with some graves and other structures. The postholes concentrate especially to two areas, one of which has a farmstead from migration period, and the other with several simultaneous as well as overlapping buildings, at least from Viking age.

Right outside the excavated area lies also a medieval churchyard. The church was first mentioned in 1355, the priest already in 1298. If there has been enough people and a need for a church in Madla some 200-300 years after the last recognised houses on the site, surely there has been more than one or two families living there in the Iron Age also?

The aim of my study is not only to look at changes on the site, but to turn the focus also out from it, to the surrounding area. Looking into the reports from the county's surveys and earlier excavations alongside the material from the excavations in 2018, it seems that either the settlements have been more scattered in the late Neolithic and bronze age, e.g. single farms, or the population has been more extensive than it was in the Iron Age. My hypothesis is that in the Iron Age and especially towards the medieval, the settlement patterns have changed in the area, moving from single farms towards hamlets or little villages.

17 **VILLAGE PEOPLE? – WHAT DO WE KNOW ABOUT THEM?**

Author(s): Tretola Martinez, Debora (Institut für Archäologische Wissenschaften, Universität Bern)

Presentation Format: Oral

According to written sources, and Julius Caesar in particular, in the late Iron Age, the settlement of the southern Upper Rhine Valley was marked by various upheavals, such as the Germanic incursions under Ariovistus, the exodus and forced return of the Rauraci who had settled here and finally the foundation of the Colonia Raurica in 44 BC.

Against this background, regional research focussed primarily on (proto)urban settlements such as Oppida and the colony in question, especially as rural settlements were hardly known.

With the increasing amount of developer funded archaeological investigations, the number of rural settlements has multiplied, so that for the first time, thorough overviews of the Late Iron Age settlement in the southern Upper Rhine Valley are possible.

The starting point for this presentation is a multi-phase farmstead from Reinach (Switzerland, Canton Baselland). Thanks to an exceptionally good preservation and the abundance of finds (including archaeobiological material), it is possible on the one hand to reconstruct the settlement dynamics here, and on the other hand to identify areas used for different purposes within the site.

Furthermore, the southern Upper Rhine area will be considered as a unit across national borders and its rural settlement system will be analysed. The focus here is on settlements that were in use during the period between the 1st century BC and the 1st century AD. The aim of this analysis is to determine whether there is a common rhythm in the development and abandonment of rural settlements in this region and whether the differences in the life duration of the individual settlements can be explained topographically or functionally. Finally, I will discuss whether the far-reaching upheavals known from written sources in connection with the Gallic wars can be identified in the archaeological record.

18 **THE VILLAGE – VILL AND TOWNSHIP IN DENMARK IN A 1ST MILLENNIUM-PERSPECTIVE**

Author(s): Hansen, Jesper (Odense City Museums)

Presentation Format: Oral

In the middle of the first millennium, the settlement organization was fundamentally changed in the area that constitutes present-day Denmark. The changes that can be observed and dated to the period around 600 AD have made particularly significant archaeological imprints. This is not only reflected in a micro-perspective within the individual settlement – buildings, tofts and relationships between them – but likewise, in the overall geographical settlement organization seen from a regional perspective and across villages in different natural landscape types.

However, the changes of the settlement structure can also be seen on a more cognitive level and thus as decisive for the basic perceptions of what we call villages today and how it could have been experienced in the Iron Age.

In the paper, I will present a case study from Funen and Jutland in Denmark and there will be a focus on the village as a concept from two different perspectives; a user's perspective within the village itself as well as an organizational perspective grounded in central management and power. I will argue, that changes around 600 AD was initially a bottom-up-response to a centrally initiated reorganization and division of landscapes, as simple fiscal rights to land was introduced as a backbone of central power, in contrast to individual alliances and everchanging relations in the previous period.

The analyses are basically archaeological based, but also incorporates historical sources, maps and place names as part of an extensive empirical basis. The presentation is part of the research project, 'From Central Space to Urban Place', which is funded

by the Velux Foundation as a four-year research project.

19 (PRE)HISTORIC VILLAGES OF NORWAY

Author(s): Gjerpe, Lars Erik (University of Oslo)

Presentation Format: Oral

The single farm has been regarded as the standard agriculture settlement unit of Norway from the introduction of agriculture onwards. Norwegian has no word for village, although the Danish term landsby has been used to describe a few prehistoric nucleated settlement, in particular Forsand. The last few years researchers have suggested there was villages in Norway in historic times as well.

The historians Village-or-not discussion has focused on the so-called klyngetun, literally cluster farmyard. The klyngetun is well recorded in Western Norway, and although most were demolished 1850—1950, a few are still preserved. The buildings of three or more farms were set in a cluster and the cultivated land diverted into long and narrow strips. In most European countries, this would be called a village or hamlet, but several researchers have argued that the klyngetun lack formal organization or institutions and they have therefore rejected the village interpretation.

I will argue that from an archaeological point of view, focusing on spatial organization of settlement and fields, there is no doubt that the klyngetun really was a village or hamlet. Further, I will also demonstrate there were hamlet-like structures in prehistoric Norway.

20 EARLY MEDIEVAL SETTLEMENT PATTERNS ON THE DRAVA PLAIN IN NORTH-EASTERN SLOVENIA AND ITS INTERDEPENDENCY WITH THE NATURAL LANDSCAPE

Author(s): Magdic, Andrej (Institute for the Protection of Cultural Heritage of Slovenia)

Presentation Format: Oral

The state organisation of the Roman Empire in today's north-eastern part of the Republic of Slovenia took a steep decline in the beginning of the 5th century. This can be well observed in the city of Colonia Ulpia Traiana Poetovio, one of the Roman urban centres of Pannonia, as well as in the surrounding rural area on the Drava Plain. There is no certain archaeological evidence of Roman settlement after that time period.

The examined area was settled again in the 7th Century, with Slavs, arriving from the Pannonian Plane. In the Slovenian archaeology this process is understood as the onset of the Early Middle Ages.

The early medieval settlement, with its rural characteristics, was not homogeneous. Archaeological research shows diverse dispersion of Slavic dwelling remains in the landscape, which significantly distinguish in number and form as well as in their interdependency to the landscape's natural conditions. The natural landscape of the Drava Plain, with its surrounding hills, reflects a diverse pattern of topographical features, which differ in slope degree, rock and soil bases, as well as in varying water regimes.

The early medieval archaeological evidence was correlated with the landscape's natural features by the use of GIS tools. The result is an interpretation of the settlement patterns through the time span of the Early Middle Ages.

247 SEAC 27: FRONTIERS IN THEORY, METHODOLOGY AND EDUCATION WITHIN CULTURAL ASTRONOMY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Rappenglück, Michael (SEAC - European Society for Astronomy in Culture); Vice President; Society for Archaeoastronomy, Germany; Adult Education Centre and Observatory, Gilching) - Zotti, Georg (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology - LBI ArchPro; European Society for Astronomy in Culture - SEAC; Society for Archaeoastronomy, Germany)

Format: Regular session

From its inception, archaeoastronomy has relied on 'alignment hunting' with little theory, systematic methodology or engagement with the wider socio-historic record. But the field has evolved and expanded into other areas of scholarly research seeking ways to identify and reconstruct the role played by celestial objects in the lifeworld and cosmovision of the societies. Current approaches allow for inferences to be drawn from the material record of past societies which, in turn, permit the role played by celestial objects to be examined, including the conceptualization of time, space and wayfaring. Computational approaches have become available, allowing for robust statistical tests to be widely implemented while new visualization tools are being used to present results for a wider audience. In addition, investigators working in other fields under the purview of Cultural Astronomy have brought their own theories and methods to bear on the historical, archaeological and anthropological record, making this a truly multidisciplinary field with its own rewards but also its own challenges.

This session will focus on the theoretical, methodological and educational frontiers of Cultural Astronomy. Papers will discuss traditionally and more recent approaches. Questions to be addressed include: What assumptions are implicit in current approaches? Which methodologies can be successfully applied and how are they related? Under what conditions can astronomy help with dating, if at all? What statistical inference methods are relevant? What tools can be used to aid researchers in visualizing prehistoric skies and communicating research results to a broader audience? How can the borders between pseudoscience, amateur science, bad science, pathological science, and even popular science be demarcated and evaluated? What initiatives are underway to teach students and members of the public about the field of Cultural Astronomy?

ABSTRACTS

1 AN ARCHAEOLOGIST'S COMMENTS ON EUROPEAN PREHISTORIC SKY ROLE INVESTIGATION METHODOLOGIES

Author(s): Pasztor, Emilia (Türr István Museum, Baja; Research team 'Investigation of prehistoric earthworks in Zala county')

Presentation Format: Oral

Archaeoastronomy has several definitions but they all involve the ancient cultural environment. Therefore, its thorough understanding is essential for such research. Since we explore the astronomical knowledge of ancient cultures through tangible remains, we should then give priority to archaeological approach in evaluating data.

Archaeoastronomy is a discipline in which cooperation between astronomy and archaeology is inevitable. An astronomer does not have thorough and profound knowledge about the cultural environment of the artefact or archaeological feature to be examined. At the same time an archaeologist fails to notice valuable information because of his "astronomical" ignorance.

Therefore, the lack of real cooperation may result either in assumptions about the high degree of astronomical knowledge of some prehistoric cultural groups, or rigid refusal of any astronomical knowledge.

As an archaeologist and a dedicated and consistent promoter of archaeoastronomy, the author has been studying European prehistoric sky lore for decades and reviewing relevant research papers. She wants to share her experience, and thus she introduces several types of archaeoastronomy case studies in her presentation which lack sufficient consideration for cultural and/or archaeological context and build up belief systems based on a single finding. She presents a collection of typical mistakes made through the astronomical interpretation of monument orientations. In conclusion, she outlines the steps of the correct methodological process.

At the same time, she draws attention, through relevant ethnographic examples, to the indigenous way of thinking, their relation to nature and the important role celestial phenomena play in their worldview. All of this can be reflected in their material culture that is the basic source of archaeology.

2 ARCHAEOASTRONOMICAL SITES AS FIELDS OF RELATIONSHIP

Author(s): Iwaniszewski, Stanislaw (Posgrado en Arqueología Escuela Nacional de Antropología e Historia - Instituto)

Presentation Format: Oral

Studies dealing with astronomical alignments encoded in public, ceremonial or funerary architecture not only inform us how the heavens were known and experienced in particular places but also provide insights into how they were positioned within a broader context of human activities within which they functioned.

In order to treat archaeoastronomical sites as Ingold's relational fields, the sightlines connecting sites with celestial targets should be viewed as embodying relationships between those sites, particular landmarks and celestial targets, and human beings. These elements constitute webs of meanings within which specific activities were generated, performed, and negotiated. To conclude, structures encoding celestial alignments embody the joint participation of different human and nonhuman entities whose actions were regulated through the skywatching and timekeeping.

At many locations, astronomical alignments continue to make relationships with celestial bodies, maintaining their relatedness with the neighboring others, even without the presence of ancient or native skywatchers. Therefore, observing astronomical phenomena from archaeoastronomical sites not only enables today's archaeoastronomers to perceive nearly the same events as did the skywatchers in the remote past but also allows them to settle within similar (but not identical) relational fields to get insights into the forms of engagement with other environmental components. The paper will draw examples from the archaeological sites from Mexico and Poland.

3 THE ARCHEOLOGICAL PERTINENCE OF ARCHAEOASTRONOMY: LESSONS-LEARNED FROM COLLABORATION

Author(s): Munro, Andrew (The University of Oklahoma)

Presentation Format: Oral

Archaeologists, cultural astronomers, and archaeoastronomers pursue tightly-linked disciplines while separated by our own divergent cultures. Historically, we have been asking different questions. Notwithstanding, archaeology and cultural astronomy seek understanding of human culture, and specific to archaeoastronomy, we seek understanding of past cultures through the empirical analysis of material culture evidence. Viewed through that lens, I suggest that archaeoastronomy or "skyscape archaeology" must strive to become, at least in part, an effective service discipline supporting broader archaeological inquiry.

Improved collaboration in the framing of research questions and research designs are critical to find "a route out of the impasse" we have been experiencing. Review of three past examples of collaboration between archaeologists and archaeoastronomers highlights a range of both successful and failed approaches. These examples are drawn from my primary area of research focus over the past decade—the links between astronomy and the monumental architecture of the prehistoric Chacoan culture in what is today the southwestern United States. With the benefit of hindsight, we can see that the results of these three efforts are quite varied. In the best case, results were published that provide pertinent data that informs an active archaeological de-

bate. In the worst case, results were published that could not be reproduced. I discuss how the definition of research questions, the backgrounds and skills of researchers and research teams, and the collaborative process all have significant impact on outcomes.

4 **TWINKLE, TWINKLE LITTLE STAR: REVEALING METHODS THAT UNCOVERED THE RELEVANCE OF CIRCUMPOLAR BODIES IN PREHISTORIC SCOTLAND**

Author(s): Higginbottom, Gail (Incipit, Consejo Superior de Investigaciones Científicas; University of Adelaide; Australian National University) - Mom, Vincent (Digital Preservation Projects Foundation)

Presentation Format: Oral

Traditional archaeological location modelling, whilst very informative about spatial patterns across a 2D spectrum, can be limited in its contribution to understanding human choice about location. Therefore, whilst we use 2D models, our primary approaches also adapt and use statistical analyses, 3D GIS and immersion software. In this way, we have a far better chance of understanding the choices people made in regards to place and confirming the likelihood of these apparent choices, including their connection to astronomical phenomena. We use topographic, astronomic, and atmospheric data, along with information on human vision and 3D-rendering techniques, to create 3 main outputs: (i) 2-D, 360o visible horizon profiles, (ii) 3D, 360o models with visual topographic depth and layered astronomical information, where a change in time accurately alters what can be seen astronomically, as well as the position of astronomical phenomenon in relation to the landscape and (iii) data files. This is done using the valuable software called 'Horizon'. These data files contain topographic data, allowing us to test the likelihood of site locations being deliberately chosen. We have used 3D models to view how things were seen at each site from the viewpoint of an individual after statistically testing the likelihood that monuments were erected with astronomy in mind regionally, as in the case of simpler standing stone monuments, and individually, as in the case of stone circles. We have expanded these useful and highly adaptive methodologies to include the fruitful application of the software 'Stellarium'. This turns the 3D panorama observations of Horizon into a cinematographic-like experience, with 360-degree views of photo-realistic night skies as could be viewed 3,500 years ago. We will discuss the methodological challenges and revelations, which ultimately allowed us to discover the relevance of circumpolar bodies in prehistoric Scotland.

5 **THE CHIEMGAU IMPACT – A BRONZE AGE/IRON AGE METEORITE IMPACT AND ITS EXTRAORDINARY APPEARANCE IN THE ARCHAEOLOGICAL RECORD**

Author(s): Rappenglück, Barbara (Chiemgau Impact Research Team) - Hiltl, Michael (Carl Zeiss Microscopy GmbH) - Ernstson, Kord (University of Würzburg)

Presentation Format: Oral

The claim that meteorite impacts shaped human history is a well-known element of (neo-)catastrophism. But so far no evidence existed of any archaeological site directly being involved in an impact process. Such evidence has now resulted from the examination of "slags" from an excavation at Stöttham (Chiemgau, SE-Germany). Six samples, analyzed by polarizing microscope and SEM-EDS, are complex combinations of rock with metallic residues: The rocky components show typical shock metamorphism, characteristic of a meteorite impact. The metallic components are high lead bronze and iron - remnants of artefacts, which have been overprinted by a meteorite impact. These are the to our knowledge first examples worldwide of artificial remnants co-existing with impact-diagnostic shock metamorphism.

The finds are linked to the Chiemgau Impact, a prehistoric meteorite impact, which hit SE-Germany and caused more than 100 craters of five to several hundred meters diameter in an area of ca. 60 x 30 km. Also finds of meteoritic material establish the event. The impact has hitherto been dated to the Bronze Age/Iron Age. The new results from Stöttham specify the terminus post quem of the Chiemgau Impact as ca. 900 BC.

Despite of the Chiemgau Impact being the biggest proven Holocene impact, its abruptness, the explicit archaeological evidence, and its comparably good dating, cultural consequences aren't identifiable so far. This results in methodological questions to the (neo-)catastrophism paradigm.

Rappenglück, Barbara. 2008. Cosmic catastrophes and cultural disasters in prehistoric times? Chances and limits of a verification. In: Jonas Vaiskunas (ed.), *Astronomy and Cosmology in Folk Traditions and Cultural Heritage*, Klaipeda, 268-272.

Rappenglück, Barbara/Hiltl, Michael/Ernstson, Kord. 2019. "Metallic artifact remnants in a shock-metamorphosed impact breccia: an extended view of the archeological excavation at Stöttham (Chiemgau, SE-Germany)." 50th Lunar and Planetary Science Conference, Abstract #1334.

Torrence, Robin/Grattan, John (eds.). 2002. *Natural Disasters and Cultural Change*, London.

6 **HOW DO WE KNOW WHAT THEY WERE THINKING? ARCHAEOASTRONOMY BETWEEN SCIENCE AND SPECULATION – PALAEO-LITHIC CASE STUDIES**

Author(s): Rappenglück, Michael (SEAC)

Presentation Format: Oral

Archaeoastronomy, as part of Cultural Astronomy, is popular, extremely effective in the media and marketable. The fascination

paired with a maximum of fantasy, with little or no methodical claim at all, moves some to interpret archaeological objects only from an (today's) astronomical point of view. A growing number of such constructs, the majority of which are dubious and methodologically unfounded, are published in the media worldwide, giving a distorted picture of archaeoastronomy, its justification, its research objects, methods, results and limits. It is therefore necessary to discuss methodological questions of archaeoastronomy and to work out the demarcation problem between non-science, fringe-science and science. This will be done using case studies from the Palaeolithic and Epipalaeolithic archaeological inventory. Scientific research dealing with possible astronomical (and mathematical) knowledge of that period needs an appropriate methodology. Hitherto, approaches are focused mostly on partial interpretations, e.g. archaeological, economic, social, psychical, artistic, or technical ones. Archaic cultures however applied multiple levels of meaning to phenomena and objects of their lifeworld, making intensive use of symbolic, mythical and ritual forms of representation. In order to recognize and prove archaic astronomy, an interdisciplinary and multidisciplinary, multi-faceted and broadly-based variety of methods is necessary ("Integral Method"): Dates and diversity of approaches from the natural sciences and the humanities, each critically evaluated, are combined for achieving a maximum of mutual comprehensibility. It follows the hermeneutic spiral as a process of securing integrative understanding and could rely on the model of coherence of findings. The methodological elements of archaeological reconstruction, astronomical analysis and comparative interpretation (iconography, mythology, historical tradition) are combined to ensure the highest possible coherence and correctness of argumentation and evidence for a hypothesis / theory. The lecture concentrates mainly on different astronomical interpretations of mobile and parietal art, certain artefacts, landscape features, and natural or artificial structures.

7 ASTRONOMICAL DATA AND THEIR USEFULNESS FOR DATING ANCIENT SOCIETIES

Author(s): Gautschy, Rita (University of Basel)

Presentation Format: Oral

Documented astronomical observations such as the heliacal rising and setting of stars and planets, eclipses or the first and last visibility of the lunar crescent can be used to establish absolute dates for ancient societies. Frequently utilised in earlier times, the usefulness of ancient astronomical observations for dating purposes was questioned and even rejected during the last thirty years. Referring to preserved data from ancient Egypt and Mesopotamia from the 2nd millennium BCE the potential of different sets of astronomical data as well as the uncertainties and possible pitfalls of this dating method will be discussed.

Astronomical data in ancient Egypt and Mesopotamia were mainly documented for religious purposes in the 2nd millennium BCE. Thus, the data have to be extracted from texts and interpreted – different views about their nature (observed, calculated or predicted) and their interpretation are the most common source of disagreement between different scholars that may lead to diverging chronological solutions. Another point of concern is the fact that calculations of astronomical events far in the past are subject to uncertainties (e.g. the slowing down of Earth's rate of rotation). Additionally, since most documented ancient astronomical data are concerned with events occurring close to the horizon, they are especially susceptible to the prevailing seeing conditions. Dust in the air, fog and slight cloud coverage can easily prevent a successful sighting of a first lunar crescent or a heliacal rising of a star or a planet. The influence of all these factors and possible ways to deal with them will be presented.

8 VIRTUAL ARCHAEOASTRONOMY WITH STELLARIUM: AN OVERVIEW

Author(s): Zotti, Georg (Ludwig Boltzmann Inst. f. Archaeological Prospection and Virtual Archaeology)

Presentation Format: Oral

Archaeoastronomy combines skills of both archaeologists and astronomers, researchers looking mostly into the ground for material evidence of human culture with those observing and studying celestial phenomena. One important field in archaeoastronomy deals with the orientation of architecture, like temple axes or building entrances, towards particular phenomena observed in the past skies, like solstitial sunrises or sunsets, extreme points in the path of the Moon, or rising and setting points of particular bright stars.

In the past decades both disciplines have created or adopted particular software tools and workflows. Archaeologists are using CAD (Computer-Aided Design) or GIS (Geographical Information System) software to document their finds, and some create simple 3D models as visualization aid just from vertically extruded feature polygons. With advanced reconstructions, nowadays created usually in a team including 3D artists and architects, whole cities from antiquity can be reconstructed on the screen, and the use of 3D computer game technology allows the creation of lively scenes enriched with sounds, animated objects, or virtual characters in virtual environments that can be explored interactively.

In the last few years the author has joined the development team of the Stellarium open-source desktop planetarium and extended it with unique features geared towards archaeoastronomical applications. The most ambitious improvement was the addition of a time-aware 3D rendering module which allows interactive walkthroughs of virtual landscapes, so that georeferenced and time-aware site reconstructions can be combined with the simulated skies of past millennia. While simple models may be enough for scientific analysis, the rendering quality is also sufficient for higher quality models geared towards public outreach.

This presentation will give an overview of the various aspects in which Stellarium can help scientists to recreate past views of the sky over landscapes and cultures of the past and discuss a few pitfalls and open questions.

9 SKYCULTURES IN STELLARIUM: REQUEST FOR COMMENTS

Author(s): Zotti, Georg (Ludwig Boltzmann Inst. f. Archaeological Prospection and Virtual Archaeology)

Presentation Format: Oral

The free and open-source desktop planetarium Stellarium has become a popular simulation environment for astronomical phenomenology, both for scientific research and outreach. One unique feature allows to exchange the traditional European constellations of Greek/Roman tradition by constellations of other ethnic groups, as long as they are formed in the same way, i.e., by connecting bright stars into "stick figures", optionally augmented by artwork like scanned copperprints from old atlases or modern drawings guided by ethnographic research.

However, the current software infrastructure does not allow representing several important features found in non-European cultures. For example, "dark constellations" formed by the dust clouds of the Milky Way cannot be represented, and there is no way to display the Lunar stations which are important in many Asian cultures. Also the current solution for multilingual translation may require additions.

As member of the Stellarium development team I would like to present the current solutions and some of the shortcomings known to the team, and then open a round of discussion about which features should be added to future versions of Stellarium to fulfill scientific demands of today's ethnoastronomers.

10 EDUCATIONAL STRATEGIES IN SUPPORT OF THE IMPORTANCE OF EXPLORING ASTRONOMY IN CULTURE

Author(s): Gullberg, Steven (University of Oklahoma)

Presentation Format: Oral

This session will discuss the importance of including a search for the potential use of astronomy in the examination of any culture. It as well explores educational strategies to enable scholars to add astronomical research skills that will enable them to augment their studies in this pursuit.

Numerous cultures throughout history have employed astronomy in various ways. The night sky has remained essentially unchanged and much can be learned through the study of how astronomy has been viewed and used. Astronomical aspects of a culture should not be overlooked when overall knowledge can be enhanced by incorporating that society's use of astronomy into the greater understanding.

What can be learned from astronomy in culture is examined and the importance of including such research as a part of overall studies is emphasized. It is imperative that research be done more frequently in this area and this presentation endeavors to enlighten all scholars as it encourages them to regularly look for and consider possible cultural uses of the Sun, Moon, planets, and stars.

A primary goal is to help scholars to learn more about the research of astronomy in culture with the goal of increasing the numbers of those engaged with this in strong research and publication. Educational strategies and emerging programs will be discussed. Such educational initiatives will greatly strengthen such research in the future and will facilitate significant advancements in what we know about the astronomy of ancient cultures world-wide.

11 TEACHING CULTURAL ASTRONOMY TO UNDERGRADUATES WITH AN INTERDISCIPLINARY FRAME

Author(s): Holbrook, Jarita (University of the Western Cape)

Presentation Format: Oral

Cultural Astronomy is interdisciplinary connecting the arts, humanities, social & physical sciences. Data collection methods and theories are used from many disciplines and meld with methods and theories within cultural astronomy. The burden on the student is that to do cultural astronomy research it is necessary to be widely read within and across disciplines. I developed a series of courses that divided cultural astronomy content into broad regions such as Africa, North America, and the Pacific. The courses were structured to accommodate students from all parts of the university, but had to have enough mathematics and science to serve as a general science requirement. The majority of the grade for the course lay with the final project, which included a presentation and a written document. Thus, the course was designed to give the students a foundation for doing this final project that had to be original research. The students rarely opted to collect their own data, instead they re-analysed existing materials. The students learned critical thinking, formulating hypotheses, and how to test their hypotheses, as well as how to understand cultural astronomy data.

A. BEYOND THE PARADIGMS: ARCHAEOASTRONOMY AS A NEW INTERPRETATION KEY TO UNDERSTAND THE FUNCTION AND MEANING OF ANCIENT BUILDINGS

Author(s): De Franceschini, Marina (Progetto Accademia)

Presentation Format: Poster

Archaeoastronomy can give an important contribution to Archaeology for a better understanding of the function and meaning of some ancient Roman buildings. I have a first-hand direct experience in Roman archeology, and I can say that Archeoastronomy significantly helped me in questioning or revising old paradigms in Archeology. It gave me a new interpretation key to evaluate data in a different way, and to formulate innovative theories; I will present some case studies to prove it.

Archaeoastronomy is a multidisciplinary science summing up 'scientific' and 'humanistic' aspects. The 'scientific' part is up to astronomers or astrophysicists, who make calculations with algorithms to reconstruct the position of the Sun, of the Moon and other celestial bodies in a given historical period. They also ascertain whether the luminous phenomena (hierophanies) that we still see today also occurred in ancient times, and on what date.

On the other hand, the 'humanistic' part is up to archaeologists and historians, who study the ancient buildings, their construction techniques and their date, to verify if the structures that produce hierophanies still are the original ones. They also study the ancient sources and religious cults to understand the function of those buildings, and their symbolic meaning linked to the date identified by the astronomers. A final result that can only be achieved by working together.

This conference gives us the opportunity to discuss and define the sometimes controversial relationship between 'scientific' and 'humanistic' disciplines: the latter too often are underestimated or looked-at with raised eyebrows, as if they could not have the 'scientific' approach that indeed they have.

We must overcome this separation and mistrust, because mathematical calculations alone or archaeological records alone are not enough. To improve knowledge and make innovative and original discoveries, Astronomers and Archaeologists must work together with equal dignity and mutual trust.

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SEAC 27: THE ARCHAEOLOGY OF ASTRONOMY: CONCEPTS OF SPACE AND TIME MATERIALISED IN CULTURES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Šprajc, Ivan (ZRC SAZU) - Belmonte Avilés, Juan Antonio (Instituto de Astrofísica de Canarias)

Format: Regular session

The sky provides basic references for orientation in space and time. The observation of celestial regularities resulted in useful, practical knowledge that became particularly important with the origin of agriculture and the increasing need for scheduling seasonal activities. On the other hand, the order observed in the sky, apparently perfect and divine, gave rise to a variety of ideas that explain the role of heavenly bodies in the cosmic order and their influence on earthly affairs. In any social group, the exact concepts and those defined in terms of our current knowledge as "non-scientific" are intertwined and integrated in a relatively coherent worldview, which can be properly understood only if examined as a whole and in the light of the specific natural, social and historical context. Characterized by this holistic approach, archaeoastronomy attempts to reconstruct and understand astronomically-derived concepts and related practices in societies typically studied by archaeology. While markedly interdisciplinary, archaeoastronomy can thus be considered a constituent part of archaeological pursuit. Relying on both written and unwritten evidence, including spatial distribution of archaeological vestiges, it explores all cultural manifestations related to the observation of the sky, as well as their role in subsistence strategies, architectural and urban planning, religion and ritual, and political ideology. Although frequently focused on astronomical referents of architectural orientations and other alignments embedded in ancient cultural landscapes, archaeoastronomy also seeks to understand the underlying motives within the broader context of landscape archaeology. By presenting a number of case studies, which should exemplify the problems addressed and the procedures employed to solve them, this session is intended to illustrate the potential of archaeoastronomy, its relevance to archaeology, and the place it deserves within a broader framework of anthropological disciplines.

ABSTRACTS

1 'AD CAELI REGIONEM': HEAVENLY TOWNS IN THREE CONTINENTS

Author(s): González-García, Antonio César (Institute of Heritage Sciences, Incipit-CSIC)

Presentation Format: Oral

Land and landscape apprehension probably find its utmost expression in the foundation and development of a new city. Several different concepts participate in that act, notably legal, topographical and mythical, not being mutually exclusive. How the urban grid is placed on the terrain might be dictated by previously existing dwellings, trade routes, rivers or winds. However, the sky is one factor that has often been diminished or forgotten.

Several works have advocated in the recent years for the importance of studying the location and orientation of towns, and how these might have been influenced by the sky. The sky could have acted as a mythical/religious factor to sanction the foundation, a way to remember the particular day of foundation or to connect with the direction where ancestors are thought to have originated. In this sense, the study of the location and orientation of the urban grid today provides hints to glimpse into the possible sense of such layouts, providing clues to the social action behind those directions.

In the present talk, I will review the location and urban layout of three important cities in antiquity in three continents. First, I will start by presenting the case of the first urban settlements in the Americas, by examining the location and orientation of several urban centers in the Supe Valley (notably Caral, Peru). Then, I will move to the Near East to observe how the sky appears to have been a determining factor in the location of some of the most prominent features of the Nabataean capital, Petra (Jordan). Finally, I will end by identifying some elements that are clearly connected with the nearby mythical environment and how these are also connected with the sky in ancient Rome (Italy).

2 ON THE ROLE OF ASTRONOMY IN THE FORMATION OF COMPLEX SOCIETIES: EGYPT IN THE OLD KINGDOM

Author(s): Belmonte Avilés, Juan Antonio (Instituto de Astrofísica de Canarias)

Presentation Format: Oral

The Old Kingdom in Egypt represents the culmination of a long and intricate process of interaction between the members of a formative society and their landscape, as represented by the Nile Valley and the surrounding Western and Eastern deserts, or semi-deserts. Sadly, the role of the local skyscape in this process is often underestimated when not simply ignored. However, as we will show, the observation of the sky played a significant role in the creation, and success, of ancient Egyptian society.

Astronomy is one of the oldest scientific approaches for the comprehension of nature. Every single society in history has been familiar with one or another aspect of sky-watching, helping people to find their correct place in space and time and hence in cosmic order (Ma'at in ancient Egypt). Indeed, one significant aspect of heaven observation was the creation of metaphysics, i.e. a cosmology or worldview, since the enduring skies were a source of inspiration for human transcendence.

Egypt in the Old Kingdom is a paradigm of a majority of these aspects. First, an innovative and extremely useful calendar was invented in the transitional period between the 2nd and the 3rd Dynasties, the so-called civil calendar that will survive for millennia. Its origin is still a matter of controversy. Second, both an astral and a solar eschatology were developed, creating a complex but fascinating belief system whose echoes are still heard today. To accomplish this, skies were mapped and the movements of the celestial bodies, studied, analyzed and interpreted within Egypt's cultural context. Finally, architecture, from humble mastabas to skyscraping pyramids would be a reflection of this worldview in their location, orientation and design.

This talk will present updated and necessarily brief snapshots of these fundamental aspects, presenting, whenever possible, innovative ideas and tentative solutions to long standing controversial issues.

3 ASTRAL CONCERNS IN BRONZE AGE ANATOLIA

Author(s): Zangger, Eberhard (Luwian Studies)

Presentation Format: Oral

People of the Luwian and Hittite cultures in Bronze Age Anatolia were deeply concerned about the movements of the stars, the Moon and the Sun. Many temple foundations – as well as gates, chambers, tunnels – in the Hittite capital Hattuşa were built in accordance with astronomic parameters. Numerous texts found at Hattuşa relate to celestial divination reminiscent of Old Babylonian astronomical and astrological practices. With this in mind, the purpose of the Hittite rock sanctuary of Yazılıkaya, adjacent to Hattuşa, can now be elucidated. The sanctuary, first seen by Europeans in 1834, contains over ninety rock-cut reliefs of deities, humans, animals, and mythical figures dating to the second half of the 13th century BCE. The reliefs in Chamber A are arranged in groups for the purpose of keeping track of lunar months, the days of a lunar month, and years. By marking the days and synodic months, the Hittite priests were able to determine when additional months were required to keep lunar and solar years aligned. The sanctuary's Chamber B was perfectly set up for use as a star clock to tell the time during the night.

4 ORIENTATION ANALYSIS OF THE MONUMENTAL ARCHITECTURAL REMAINS AT PHRYGIAN SITE KERKENES, TURKEY

Author(s): Alpay, Ayse (Middle East Technical University)

Presentation Format: Oral

This study aimed to investigate whether the founders of the city at Kerkenes Dağ had deliberately incorporated astronomical knowledge to their city-planning through orientation analysis of selected buildings, idols, and the city gates. The excavations result suggested the idea that the whole city was planned in accordance with an ideal urban concept containing all essential elements of the city placed on strategic locations. Previous studies on Phrygians revealed that there are general orientation preferences, particularly for the idols representing the Phrygian Goddess Matar, and associated with the city gate which was often oriented towards the Sun whenever possible. At this research, the city gates, the monumental buildings found at the Palatial Complex, and idols found both at the main gate of the city, Cappadocia Gate, and at the Monumental Entrance of the Palatial Complex were examined to find out whether there was an intended orientation towards a particular star, constellations, or the Sun. Based on the determined threshold value, three meaningful results were obtained: the Ashlar Building and the Audience Hall appeared connected with the star Altair; the Structure A with the Hadar; and the North-East Gate with the summer solstice. Further analysis including other Phrygian sites is necessary in order to make credible interpretation, nevertheless, the direction of the Structure A towards the rising point of Hadar on the horizon could be interpreted as a reflection of the Thracian influence on the Phrygian culture as in southern -eastern Bulgaria a large number of dolmens and tombs were oriented towards to the Southern Cross and the Pointers (Hadar).

5 AN ARCHAEOASTRONOMICAL ANALYSIS OF THE MIDDLE BRONZE AGE ENCLOSURE BURIALS OF BONLEZ (BELGIUM)

Author(s): Motta, Silvia - Gaspani, Adriano (I.N.A.F. Istituto Nazionale Astrofisica, Astronomical Observatory Milano) - Heller, Frédéric (A.Wa.P. Agence Wallonne du Patrimoine)

Presentation Format: Oral

Bonlez, located in Wallonia, at the bottom of a valley, is a Middle Bronze Age site. Using the LIDAR surveying system, we obtained detailed high-resolution maps. Ultra-high resolution aerial lasing enables a new paradigm in global exploration. Aerial imagery, after relevant georeferencing and georectification, with its increasing resolution and precision, is becoming a useful tool in many disciplines, among them in Archaeoastronomy and other studies of ancient civilizations; using satellite images is possible to measure astronomical orientations of structures and sites. In the site of Bonlez, LiDAR has yielded half a dozen MBA burials, including the “fossile directeur” one with enclosure, similar to the British and Dutch Bell barrows.

Analyzing the high resolution images we can notice the presence of many “tumulus”, which does not seem to be randomly arranged.

Afterwards, we made measurements “in situ” in autumn and winter 2017.

Subsequently an appropriate statistical study was carried out in order to infer the distribution function of the astronomical orientations with the aim to perform an appropriate archaeoastronomical analysis.

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 possibility of some intentional orientation of the structures and we propose that there could be an astronomical intent in building the burials found at Bonlez. Our final aim is to demonstrate that there are confirmations on the intentional orientation of the mounds and that we can continue with the appropriate surveys/excavations.

6 THE PREHISTORIC TAULA SANCTUARIES AND THE CONTEMPORARY BARRAQUES OF MENORCA: A COMPARATIVE ANALYSIS WITHIN THE FRAMEWORK OF CULTURAL ASTRONOMY

Author(s): Urrutia-Aparicio, Maitane - Belmonte Avilés, Juan Antonio (Instituto de Astrofísica de Canarias)

Presentation Format: Oral

On the island of Menorca, the relationship between land- and skyline is manifested in various building typologies, such as megalithic and cyclopean tombs, and taula sanctuaries, the latter being the final outcome of the evolution of Talayotic culture in the mid-first millennium BC.

Burial monuments show a regular pattern of orientation towards the southwest sector. This fact apparently would relate Talayotic societies to those established in Languedoc and Provence, hypothetical places of origin of the population who colonized Menorca. Taulas, exclusive of Menorca, are oriented towards the southern quadrant of the horizon, with just one major exception, Torralba d'en Salort. In addition, each taula enclosure was placed so that it would have a perfect view of the southern horizon (Hoskin, Temples, tombs and their orientations, 2001). Presumably, these facts had religious purposes.

Interestingly, Menorca landscapes are also home to another type of construction called ‘barraques’, which were built in the 19th century for agricultural purposes and look like small dry-limestone ziggurats. According to local still living traditions, barraques were oriented to avoid the dominant wind from the north, the disturbing ‘tramontana’. However, their orientation pattern slightly diverts towards the southeast, suggesting the use of a common 19th century technology for orienting purposes.

Back to the taulas, the optimal vision of the stellar asterism formed by the Southern Cross and Alfa and Beta Centauri, along the main axis of the monument, would allow orienting taulas towards the south, and would also explain the need for an open and clear southern horizon. Besides, due to Equinox precession, most of these stars ceased to be visible in later centuries, perhaps leading to a gradual abandonment of the taula sanctuaries in Roman times. Hence, Talayotic people would have used the best instrument on hand of their epoch, the sky, to achieve their needs.

7 BRONZE AGE ROCK ART AND 20TH-CENTURY OIL-ON-CANVAS IMPRESSIONS OF CONSTELLATION CRUX, THE SOUTHERN CROSS

Author(s): Sterken, Christiaan (Vrije Universiteit Brussel)

Presentation Format: Oral

I present and analyse images of cross-like configurations allegedly identified with the constellation Crux that were found among petroglyphs in the Valle Hermoso (Argentina) and in the Mercantour National Park in southern France.

A similar analysis was also done for two paintings featuring Crux, made by one artist in the 1970s at the La Silla Observatory in Chile.

The comparative analysis leads to a conclusion that strengthens what Clive Ruggles explained at the Oxford IX International Symposium on Archaeoastronomy (2011): “that examples abound of attempts to draw a connection between spatial configurations on the ground, but that ‘literal’ (in the Western sense) representations of constellations in the layout of cupules is problematic because of the apparent lack of cultural precedents”.

The availability of two directly accessible oil-on-canvas impressions of a same constellation by the same artist - created less

than one year apart - emphasizes a necessary key element that must be taken into account in any interpretation: that we always deal with artwork and with artists, and that we just cannot probe the intentions of an artist, not even after half a century.

Archaeologists work with physical remains with limited information content. Linking images from the past to our modern world is a difficult undertaking, and tying in celestial icons requires additional picture elements, such as alignments or depictions of self-evident celestial bodies like the Moon. In addition, the time or era of creation of the artwork, the image scale and orientation, the commensurateness of the depicted asterism's geometric form with the one we see today, and its completeness - i.e., a match of the number of stars - should be taken into account. An overall numerical likeness, or similarity of appearance of an asterism and a rock-art creation can never be sufficient evidence for unambiguous designation or identification.

8 THE RELEVANCE OF ARCHAEOASTRONOMY TO UNDERSTANDING URBAN PLANNING AND LANDSCAPE FORMATION IN MESOAMERICA

Author(s): Šprajc, Ivan (ZRC SAZU)

Presentation Format: Oral

In a number of studies concerned with Mesoamerican architecture and urbanism, it has been argued that the spatial distribution of buildings and architectural complexes of different types and functions, specifically their relative placement with respect to the cardinal directions, reflects cosmological concepts. The archaeoastronomical investigations carried out in recent decades have provided additional information in this regard, revealing that the civic and ceremonial buildings were largely oriented on the basis of astronomical and calendrical considerations and that these criteria, notwithstanding regional and temporal variations in orientation patterns, were fundamentally the same over extensive areas and during long periods. One fact that has received less attention is that the astronomical alignments materialized in the most important buildings frequently conditioned their spatial relationships and were also reproduced, although approximately and without being observationally functional, in extensive sectors of the built environment. Several specific cases that will be discussed exemplify this practice, showing that it is precisely the importance of the astronomically significant directions that allows us to understand some clearly recognizable aspects of prehispanic urban layouts, and even of broader cultural landscapes, which have partly been preserved to the present day.

9 THE SUN AND THE MOUNTAIN AS A GUIDING PRINCIPLE IN THE GENERAL TRACE OF THE ARCHAEOLOGICAL ZONE OF MALPASITO, TABASCO

Author(s): Martz de la Vega, Hans (National School of Anthropology and History; National Autonomous University of Mexico)

Presentation Format: Oral

Since immemorial time the groups that originated the planning of the Mesoamerican settlements assigned a great importance to the landscape and the sky. For generations they devised and developed criteria for the selection of suitable places and for the design of the traces of the sites and the architectural structures that ended up constituting a complex system of beliefs that transcended at least until the arrival of the Spaniards. In fact, they were the ones who originated the calendar and assigned it an unprecedented utility.

In Mexico we have archaeological zones that cover from the year 2,500 BC until at least 900 AD, as well as documents from the ethnohistorical times, from the XVII century, and with ethnographies of Mixezoquean and Mayanse populations that allow us to make some analogies with the relationship that exists between the mountains, the Sun and the ancient traces and the concepts of the soul and the human body as well as the personhood. In the introduction it will be shown how it is a millenary tradition that can be track down with the methods and techniques of Cultural Astronomy, specifically with Archaeoastronomy.

The development of the presentation will focus on the Archaeological Zone of Malpasito, Tabasco, surely designed and built between 600 and 900 AD. We will know a spatio-temporal planning that corresponds to materialised concepts in which terrestrial and celestial elements come into harmony, such as the mountains and the Sun. The aspects of astronomy and orientation that will come into play will be: the equinox, the circumsolstitial region, the axis of 21° and the solar and non-solar mountain. Finally, we will see how it is possible that the explanation can make use of tools, in addition to archaeoastronomical, ethnological, as the one of the hidden face of the pleat of Pitarch.

10 POSSIBLE MARKERS OF WINTER SOLSTICE AND OTHER CEREMONIAL EVENTS IN ANCIENT PUEBLO ROCK ART FROM SOUTHWESTERN COLORADO, USA

Author(s): Palonka, Radoslaw (Institute of Archaeology, Jagiellonian University) - MacMillan, Vincent (Canyons of the Ancients National Monument, US Bureau of Land Management) - Gralia, Ross - Gralia, Maiya (Canyons of the Ancients National Monument) - Ciomek, Katarzyna (Institute of Archaeology, Jagiellonian University)

Presentation Format: Oral

This paper focuses on the presentation of some examples of Ancient Pueblo culture sites dated to the thirteenth century A.D. with rock art panels located in four canyons of the Canyons of the Ancients National Monument, southwestern Colorado, USA which might have been connected with astronomical observations, beliefs and ceremonial systems. There are at least six of forty five sites analyzed so far that could have been seasonal, solar or lunar markers and ceremonies and rituals connected to them. The project research also includes documentation of rock art panels and their connection to the settlement structure and landscape features like mesas and mountain ranges.

At one of these sites, located in Sand Canyon, direct observations were conducted during the summer and winter solstices of

2018. The rock art panel at the site consists of geometric depictions, mainly three spirals that prominent on the panel center and over 30 deeply engraved notches, grooves and ovals that make up the bulk of the panel. Especially promising are observations of sunlight-shadow interactions with the rock art panel during and after the winter solstice that may mark the beginning of the winter solstice ceremonial period well known from the ethnographic literature of Hopi and Zuni, the direct descendant groups of Ancient Pueblo people. Some Hopi representatives were also consulted about rock art panels in the field in 2016 and 2017.

This research is a part of the project that has been conducted since 2011 by the Institute of Archaeology, Jagiellonian University in Krakow, Poland in cooperation with several American institutions: Crow Canyon Archaeological Center and the Canyons of the Ancients National Monument (a branch of the Bureau of Land Management), Colorado, and the Hopi Cultural Preservation Office in Arizona.

11 THE PROBLEM OF THE ORIENTATION OF GALLO-ROMAN SANCTUARIES

Author(s): Garcia-Quintela, Marco - Espinosa-Espinosa, David (University of Santiago de Compostela) - Gonzalez-Garcia, A Cesar (CSIC)

Presentation Format: Oral

There are nearly 900 Gallo-Roman sanctuaries known from different types of sources (either excavated ones –a handful can be visited while most were covered and are no longer visible; some were discovered from aerial photography, or by different types of prospection and geo-physical methodologies). Besides, there is an important number of Gallic sanctuaries, most of them originally built in non-lasting materials and bearably undetectable on site today. These paucity of data presents a problem for Archaeoastronomical studies.

On the one hand, for those where there is topographic information, or in some regional studies, the literature insists on highlighting an eastward orientation of most structures. However, and at the same time, there are also twists in orientation and skewness between the cellae and the perimeter enclosure of the Sanctuaries. It is worth indicating that there are no systematic studies on these questions.

On the other hand, contemporary literary evidence indicate that druids had, among others, the function to observe celestial phenomena and keeping in shape a luni-solar calendar to, for instance, coordinate their annual meetings (Caesar 6.13.10).

In this communication, we present this question and how we have tried to tackle the challenge in a practical way. We present the orientation of 79 temples (20 located in 6 oppida, 34 in 14 Gallo-Roman towns, 21 peri-urban to 11 towns and 4 outside towns). The results highlight the interest of this kind of approach to apprehend the relation with the pre-Roman Gallic religion and its materialization under the Empire when complex time-space relations are set.

12 ASTRONOMICAL ORIENTATION AND LUMINOUS PHENOMENA IN AVENTICUM, THE CAPITAL OF ANCIENT ROMAN HELVETIA

Author(s): De Franceschini, Marina (Progetto Accademia) - Veneziano, Giuseppe (Astronomical Observatory of Genoa)

Presentation Format: Oral

Since one of the visits planned during this Conference will be in Avenches, I am proposing a presentation on archaeoastronomy in that town, once the capital of Helvetia.

During the last SIA conference in Genoa (Italy) we presented the preliminary results of our study. Now we present the final results, showing that the Romans built astronomically oriented cities and buildings with luminous phenomena also in the provinces of the Empire.

During the visit of the archaeological site of Avenches, the director of the local Museum, Marie-France Krause explained that the Temple of Cigognier and the Theater were aligned on the same axis, and ritual processions were probably taking place between the two. This information reminded us of the link between the sanctuaries of Isis and the Theaters, where sacred processions and representations were held. Perhaps the complex could be astronomically oriented, as are many sanctuaries of goddess Isis.

A first compass measurement on the spot gave encouraging indications, with azimuth values close to those of the sun at Summer Solstice. Those measurements were verified and confirmed by Giuseppe Veneziano, using the satellite images of Google Earth, which indicated an orientation perfectly matching the sun's azimuth. Further inquiries and simulations were made with the software Starry Night pro.

On June 20-21st, 2018 (Summer Solstice) Marina De Franceschini was in Avenches to make on-site observations and verify the theory. She took pictures at dawn and sunset which confirmed the hypothesis of the astronomical orientation of the complex formed by the Temple of Cigognier and the Theater, and also of the East and West gates of the city.

The astronomical orientation produced different luminous phenomena which can be related to Roman Imperial cult. This study hopefully will open the way to new studies and discoveries on this subject, throughout Europe.

13

PRELIMINARY REPORT ON THE STUDY OF THE ORIENTATION OF 60 GALLO-ROMAN TOWNS

Author(s): Garcia-Quintela, Marco - Espinosa-Espinosa, David (Universidade de Santiago de Compostela) - Rodriguez-Anton, Andrea (Universidad de La Laguna) - Belmonte, Juan (Instituto de Astrofísica de Canarias) - Gonzalez-Garcia, A. Cesar (Instituto de Ciencias del Patrimonio - CSIC)

Presentation Format: Oral

From 2011 to 2018 our team has measured the orientation of 60 Gallo-Roman towns with 65 urban layouts. We have considered the decumani, basilicae and forums of the different settlements in order to establish the general orientation of each grid. Also, we have privileged towns founded at the time of Augustus, although we have also included others built before and after this period.

Previous works during the last decade have studied the orientation of samples of Roman towns in Italy (Magli 2008), Hispania (Rodríguez-Antón et al. 2018), North-Africa (Rodríguez-Antón et al. 2017) and Iliria (Belmonte et al. 2019). Also, there are studies on particular towns (Lyon, García Quintela & González-García 2014; Aosta, Bertarione & Magli 2014; Cartagena, González-García et al. 2016; Trier, Espinosa-Espinosa et al. 2016; and Cologne, Espinosa-Espinosa & González-García 2017), or for specific groups of towns (like those founded at the time of Augustus, González-García et al. 2019). These studies show the existence of different, but consistent, orientation patterns which can be understood in the light of the Roman culture and its interaction with previous local traditions.

What makes our sample for Gaul different is the spatial and temporal concentration of the sample at the time of Augustus, when the conquest is still recent and the existence of possible footprints of previous beliefs, either in confluence or in conflict with the Augustan astral ideology, can still be detected.

Our analysis highlights two different urban orientation patterns north and south of the Roman way that connected Lyon with Saintes. To the south, the orientation is mostly cardinal, perhaps connected with the birthday of Augustus, while, to the north, the orientations are closely connected to the Celtic start of season festivals. This allows to purpose the existence of such festivals within the Gaulish culture before the Roman conquest.

14

ARCHAEOLOGY AND THE MATERIALITY OF ASTROLOGY

Author(s): Campion, Nicholas (University of Wales Trinity Saint David)

Presentation Format: Oral

Astrology (the claim that the stars and planets have significance or meaning for terrestrial affairs) is one of the pervasive practical applications of astronomy, with which it is closely associated in all premodern societies. It is also a form of cultural astronomy. This paper will consider astrology and materiality, introducing its connections with the body, space and place, and religious iconography (for example, navagraha – nine planet – temples in India). In particular the paper will address the relationship between astrology and architecture through its role in the foundation of cities, notably Constantinople, Baghdad and Cairo. A theoretical perspective will be adapted from Michel Foucault's theory of knowledge and archaeology (Foucault, Michel, *The Archaeology of Knowledge*, London: Routledge, 2002), and Paul Colilli's archaeology of astrology as an epistemological ruin (Colilli, Paul, *Agamben and the Signature of Astrology: Spheres of Potentiality* (New York: Lexington Books, 2015)). The paper will conclude that if astrology, as a form of cultural astronomy, had a role in the creation of notable archaeological sites, then the history of astrology itself as a system of thought which flourished in the classical and medieval worlds, can be considered through the analogy of archaeology.

15

MEDIEVAL CISTERCIAN CHURCHES IN ITALY AND SWITZERLAND: ORIENTATION – LIGHT INCIDENCE – COMPARATIVE ANALYSIS – METHODOLOGY

Author(s): Spinazzè, Eva (University of Ca' Foscari Venice)

Presentation Format: Oral

Ten Cistercian complexes situated in Northern Italy and Switzerland will be discussed by the author (archaeologist and historian) regarding their orientation, light incidence and the methodology used. On each sacred building an accurate georeferenced survey during fieldwork with astronomical calculations was carried out, the information crosschecked with primary, secondary sources and comparative analyses performed. The hydrogeological factors, morphology of the environment and the local horizon were considered. Cistercian churches situated in flat land (five in Italy) and in mountain environment (five in Switzerland) were compared. These results were measured up with the data of the over 220 medieval churches studied in the last 12 years by the author (with the same method).

It is an interdisciplinary research which interweaves architecture, archaeology, topography, history, liturgy and astronomy. The plants, reports of archaeological excavations are fundamental to compare the alignment of probable prior fundaments under the existing ones.

The aim of this research is to understand the disposition of the original and successive churches into space and whether the rules dictated by the tradition of observing the Sun (associated to Christ) or Moon (to the Virgin Mary) in Medieval Ages were also applied to a sacred building beyond the Alps in mountain setting where their rising and setting are more difficult so see.

The results here obtained are of most importance for the history of architecture and liturgy, as they show in all ten cases a precise alignment – a liaison with the sky – toward the setting or rising Sun on liturgical feast days, mainly toward the two Mary

main feasts celebrated during the Middle Ages: Annunciation, March 25th and Assumption, August 15th, both for the position in the flat land and in mountain setting. Moreover, these results reinforce the data obtained by the author for the other 220 sacred buildings.

A. **AN INTERPRETATIVE KEY FOR THE PLURAL APPROPRIATION OF THE CRUX-CENTAURI ALIGNMENT ACROSS PREHISTORIC EUROPE: A COMPARATIVE REVIEW**

Author(s): Cristofaro, Ilaria (University of Wales Trinity Saint David; Astronomical Observatory Sirio, Castellana Grotte) - Balbi, José (Colchester Archaeological Group; Ministerio de Cultura y Educacion, Argentina)

Presentation Format: Poster

The rising and setting of the Crux-Centauri asterism was embodied in the architectural structures of several cultures across prehistoric Europe, from Menorca to Malta, from Neolithic Britain to the Funnel Beaker culture, from Sardinia to Daunia (García Rosselló et al. 2000; Hoskin 2001; Esteban et al. 2001; Belmonte and Hoskin 2002; Zedda and Belmonte 2004; Mann 2010; González-García and Costa-Ferrer 2003; Antonello et al. 2016). This evidence suggests a plural appropriation of meanings related to this asterism; at the same time a vacuum regarding the interpretation of this stellar alignment for prehistoric societies can be attested. This is due to a fail, within the discipline of skyscape archaeology, to appreciate the movements of the Milky Way in respect to the local horizon. As astronomical simulations show, across the different geographical latitudes and the construction times of the archaeological sites under consideration, the Milky Way was seen performing a dramatic oscillation in the sky related to the Crux-Centauri rising and setting: in just a couple of hours, the galactic circle of light fell down on the west in a way to lay flat encircling the whole horizon, and raised up from the east (Stellarium 2018). By performing a comparative analysis of the data, this research argues that the rising and setting of the Crux-Centauri asterism just above the southern horizon was meaningful since it marked the pivot point of the galactic motion. Thus, this archaeoastronomical alignment may be regarded as a consistent pattern overlapping different European prehistoric cosmologies beyond their local specificities. The study seeks to provide a methodological step forward in the possible range of interpretations for archaeoastronomical orientations and the relative determination of intentionality by including considerations on the Milky Way apparent motion, as well as to provide material evidence for the universality of skyscape narratives within archaeological sites.

B. **THE REPRESENTATION OF ASTRONOMICAL CYCLES AND VARIABLE TIME PERIODS IN IRISH MEGALITHIC ART**

Author(s): Türlér, Marc (Swiss Academy of Sciences; formerly University of Geneva)

Presentation Format: Poster

The regular cycles of the sun, the moon and the stars must have fascinated mankind already in prehistoric times. At least in the Neolithic era, settled communities would most likely have attached a great importance to these cycles, because they are linked to the passage of seasons affecting their agricultural life. Understanding these cycles and being able to represent them by symbols for preservation and transmission to the next generation could have been a challenge for an intellectual elite. We make the hypothesis that some of the motifs engraved on the kerb and interior stones of the UNESCO World Heritage tumuli of Newgrange and Knowth, nearby Dublin, could be representations of variable time periods and cyclical processes. To test this hypothesis, we reconsider with an openminded attitude how Neolithic people could possibly have represented such abstract notions. We find that spirals are the most natural representations of cycles and that an increase followed by a decrease of a time period such as daylight over a year can be simply represented by a filled triangle or lozenge. It suggests that these three common motifs of Irish megalithic art are all linked to the representation of time. It would explain the association of spirals with series of triangles or lozenges on all three richly decorated kerbstones of Newgrange. In particular, on the entrance stone of the passageway illuminated by the rising sun on the winter solstice. This work strengthens the case of our earlier result that five of the most complex Irish spiral motifs are very likely calendrical representations. Indeed, their specific design reflects up to five manifestations of the sun and the moon over months and seasons, which could have been easily identified by Neolithic observers.

C. **THE ETRUSCAN TEMPLES: AN ANALYSIS OF THE DISTRIBUTION OF THE DATA RELATED TO THEIR ORIENTATION**

Author(s): Pernigotti, Antonio Paolo (Università degli Studi di Milano)

Presentation Format: Poster

In the Spring of 2013 a series of field campaigns were started aimed at measuring azimuths and, where possible, the horizon heights, of 28 Etruscan sacred structures (so as to verify the previous samples present in Prayon 1991 and Aveni-Romano 1994). The results achieved in this work (Pernigotti 2019) led to the hypothesis that the orientation of Etruscan temples was determined by the movement of the Sun, with a clear preference for that sky arc where the Sun never rises or sets but where it goes through every day of the year, lighting up the front of the sacred structures for multiple hours a day. Starting from these results, the goal of the first part of this contribution will be to focus on a more specific analysis of the collected data, concerning the distribution of the orientations, to proceed, in the second part, to a comparison with those concerning both the temples of the Greek cities of Sicily and Magna Graecia (Aveni-Romano 2000; Salt 2009; Hannah-Magli-Orlando 2017), and the sacred buildings of the Samnite centers (Ruggeri 2010). This comparison will allow us to identify similarities and differences, regarding temple orientation, between the Etruscan tradition and those of two populations geographically and culturally close to the com-

munities of Etruria. Finally, in the last part of the contribution, through an interdisciplinary approach that combines data from the archaeological, epigraphic and literary record to those of archaeoastronomy, it will try to return, in the light of the analysis of the data and comparisons made, both on the reasons that may have determined the general distribution of the orientation of Etruscan temples, both on the motivations and the factors that may have influenced the orientations of the single structures.

D. **PERGUSA LAKE, COZZO MATRICE'S SITE AND CERES ROCK IN ENNA: MYTH, LANDSCAPE AND SKYSCAPE ARCHAEOLOGY IN CENTRAL SICILY**

Author(s): Orlando, Andrea (Istituto di Archeoastronomia Siciliana; Fondazione Floresta Longo) - Raffiotta, Serena - Nicoletti, Rossella (Independent researcher) - Gori, Davide (Wood plc; Istituto di Archeoastronomia Siciliana) - Messina, Emilio (SicilyExplorers)

Presentation Format: Poster

The Pergusa Lake, near Enna, one of the few natural lakes present today in Sicily, is the place where it was placed by many authors of the classical world (e.g. Aristotle, Diodorus Siculus and Ovid) the "kidnapping of Persephone", one of the most fascinating episodes of ancient mythology. The Lake is characterized by a particular ecosystem and by a singular phenomenon that sporadically leads to a reddening of the waters, an event that probably also impressed our ancestors to the point of considering it a mythical place. A short distance from the lake, in the North direction, there are a series of hills, among which Cozzo Matrice stands out, where there is a vast archaeological area consisting of the remains of an indigenous village with annexed necropolis, sacred buildings and a very suggestive natural cave, probably destined to religious activities.

The Cozzo Matrice site is in visual contact with the Pergusa Lake to the south, and to the northwest with the town of Enna, where there is the so-called 'Ceres Rock' (about 1000 masl), from where you can enjoy a 360° breathtaking view. In this area was located the most important shrine dedicated to Demeter in the Greek era, and then to Ceres in Roman times. Cicero, for example, described with minute detail the presence in this place of two colossal statues "ante aedem Cereris in open ac propatulo loco": one represented Ceres, bearing a statue of Victory on the right hand, the other Triptolemus.

Attended without interruption for millennia, today the Ceres Rock shows several carvings in the rock, in part probably attributable to the important sacred area.

The study illustrated here presents the analysis of the two archaeological sites (Ceres Rock and Cozzo Matrice) from the point of view of the landscape: terrestrial and celestial (skyscape).

E. **PISCES, A ZODIAC SIGN FOUND ON A NABATAEAN TOMB FAÇADE IN HEGRA**

Author(s): Almushawah, Munirah (Royal Commission for AlUla)

Presentation Format: Poster

Hegra, a major Nabataean city in the northwestern part of Saudi Arabia. A recent visit to the site resulted in noticing a very interesting petroglyph of two fishes, representing the constellation of Pisces, one of the twelve segments of the ecliptic.

The figure is engraved near tomb IGN 17, A Nabataean monumental tomb cut into the massif of Qasr al-Bint, with a funerary inscription, inscribed above the entrance, dating its construction to the era of the Nabataean king Al-Harithah who ruled in the period between 9 B.C.E - 40 CE.

The zodiac sign was carved on the side of the tomb, along with two snakes and an eagle, two very widespread mythological symbols associated with the worship of the sun in the Nabatean religion. Although the carving of a fish in the middle of the desert is highly uncommon, similar images of sea nature are evident in Nabataean art. A female bust from the temple at Khirbet al-Tannur, found crowned with two fish on top of her head is an example. Another is the two fish figures representing Pisces among the zodiac signs found at Khirbet al-Dharih in Jordan.

The Nabateans have centralized in a location within many of the richest civilizations at that time. Their proficiency to mix and blend with foreign civilizations, while still Preserving their own traditional culture led to their wealth, prosperity, knowledge and independence. This enabled them to last for hundreds of years much longer than other Near Eastern kingdoms. Nabateans excelled in many aspects of life, but in this paper archaeological records are presented from an Archaeoastronomical perspective, to emphasize the Nabataeans relationship with the sky, and to demonstrate the potential of Archaeoastronomy and its relevance to archaeology.

F. **THE TEMPLAR CHURCH OF SAN GILLIO (ITALY): AN ARCHAEOASTRONOMICAL ANALYSIS AND DIGITAL SURVEY.**

Author(s): Motta, Silvia (I.N.A.F. Istituto Nazionale Astrofisica, Astronomical Observatory Milano; Società Astronomica Italiana - SAIt) - Gaspani, Adriano (I.N.A.F. Istituto Nazionale Astrofisica, Astronomical Observatory Milano)

Presentation Format: Poster

San Gillio is located North-West of Turin, in Piedmont. The toponym derives from the Italian version of the French name ,Saint Gilles, corresponding to the Latin name Egidio, to whom the parish is still consecrated . San Gillio Church was originally a dependency of the Templar priory of Sant'Egidio di Testona (now Moncalieri) and in a document it is mentioned as "Sancti Aegidij house-fort", a squat - walls fort built in 1150. Nowadays you can see only the ancient abandoned church which lies half hidden by brambles in a clearing on the edge of a thicket.

In one of our previous essays on architectural alignments in many Templar churches, by applying a rigorous methodology, we pointed out that astronomical reference points had been often set at the horizon so we might state the existence of orientation patterns used by Templar Knights for designing their churches.

Measurements were collected in summer 2018 in situ by the authors and then an appropriate statistical study was carried out in order to better understand a distribution function of the alignments and an appropriate archaeoastronomical analysis.

We adopted the most recent techniques belonging to the theory of the Circular Data that is the most suitable ones in the archaeoastronomical data processing. Statistical tests have been applied to prove the confidence level of the results that we achieved. Furthermore we used a satellite data processing software to analyze Ultra-high resolution satellite images in order to enable a new paradigm in global exploration. Surveying sub-meter resolution satellite images is one of the most accurate methods to get preliminary information about the possibility of finding out remains of the ancient mansion in the subsoil of the surrounding wood. Developing this study we have claimed to outline the results of archaeoastronomical investigation and digital survey dealing with this site.

251 THE 4TH M BC IN EUROPE: EXPLORING THE SUPRAREGIONAL ENTANGLEMENTS AS TRIGGERS FOR CULTURAL, SOCIAL AND ECONOMIC TRANSFORMATIONS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Charnot, Marie (UMR 6298 ARTEHIS; Université de Bourgogne) - Jammet-Reynal, Loïc (Archéologie Alsace; Université de Strasbourg - UMR 7044) - Gleich, Philipp (University of Basel) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research)

Format: Regular session

The 4th millennium BC is a time of radical transformations in the European Neolithic. Moreover, the 35th century is considered as a 'turning point' by many researchers (Pétrequin et al., 2006 ; Fedele, 2013). On one hand, long-distance exchanges can be traced by mapping supraregional entanglements in pottery styles, lithic tools and metal objects. For example potteries evocating Munzingen shapes that are typical for the Upper Rhine Valley can be found on the Swiss Plateau too, or polished axes made from vosgian rocks were distributed as far as the Lake Constance regions. On the other hand, fundamental general changes in material culture (early copper metallurgy in the East) and ritual practices (expansion of collective burials) between the first and second part of the 4th millennium raise the issue of contacts that social groups have maintained among themselves, in time and space. The aim of this session is to gain a deeper understanding of such phenomena by asking the following questions:

- How can we identify and interpret different forms of relationships between social groups in the 4th M BC?
- How do they change over time until the beginning of the 3rd M BC?
- To what extent are we able to identify, through the study of material culture, markers of filiation and transmission between different regional groups?
- Can we approach the reasons for transformations?

In some parts of Europe, the 4th millennium is commonly referred to as the Chalcolithic (Lichardus et al., 1985). Even if the copper metallurgy is not widely adopted by every region in Europe at that time, this millennium has been over and over pointed out as the origin of many innovations. This session aims to link different perspectives and interpretations around this question in order to define triggers and patterns of change in Neolithic societies.

ABSTRACTS

1 FIRST COPPER METALLURGY IN SCANDINAVIA. EARLY NEOLITHIC CRUCIBLE AND NOZZLE FROM LØNT, EASTERN JUTLAND, DENMARK

Author(s): Gebauer, Anne Birgitte (National Museum of Denmark)

Presentation Format: Oral

Metallurgy in Scandinavia was previously unknown until the Bronze Age. Fragments of a crucible and a possible nozzle found in a secure Neolithic context provide evidence of copper metallurgy in Scandinavia at least 1500 years earlier. The crucible was found at Lønt near Haderslev in eastern Jutland, Denmark. The technical ceramics were situated in a cultural layer containing early Neolithic Funnel Beaker pottery dating from around 3800 – 3500 BC and situated beneath four megalithic tombs providing an ante quem date of 3300 – 3100 BC. The presence of a copper alloy in the crucible is confirmed by three independent X-ray fluorescence analyses using both a hand-held and a stationary instrument, SEM-EDS analysis of a cross-section as well as a Bruker Tornado μ -X-Ray-fluorescence scanner (μ -XRF). The transmission of metallurgy to southern Scandinavia seems to be part of supra-regional networks introducing other phenomena like long barrows, causewayed enclosures, two-aisled houses and certain types of artefacts that enabled the establishment of a fully Neolithic society. The presence of local know how in heat treatment of metal also raises questions of the role in society of the smiths as well as the copper artefacts.

2 COPPER METALLURGY IN SWITZERLAND AND BEYOND: NEW INSIGHTS INTO A COMPLEX PHENOMENON

Author(s): van Willigen, Samuel (Swiss National Museum) - Gross, Eda (Kantonsarchäologie Zug) - Hildbrand, Erwin (Swiss National Museum) - Nielsen, Ebbe (Kantonsarchäologie Luzern) - Reitmaier, Thomas (Archäologischer Dienst Graubünden) - Schäppi, Kathrin (Kantonsarchäologie Schaffhausen) - Schaeren, Gishan (Kantonsarchäologie Zug) - Schmidt-Ott, Katharina (Swiss National Museum) - Steinhauser-Zimmermann, Regula (Kantonsarchäologie St. Gallen) - Villa, Igor (University of Berne)

Presentation Format: Oral

In regards to early copper metallurgy, the areas north-west of the Swiss Prealps are amongst the best-documented regions of Europe. Since the 1990s scholars have assumed that during the course of the Neolithic there were several metallurgical traditions in this region. New finds as well as a series of new analytical methods allow us now to check this hypothesis and to reassess how these metallurgies fit into the transregional networks using a combination of various methods (typology, trace element analysis, Pb isotope analysis). This approach has shown that, for the 4th and early 3rd millennium BCE, it is possible to distinguish between at least three different strands of traditions that did not follow from one another. According to first trace element and Pb isotope analyses of early 4th millennium BCE axe blades from Switzerland, pure and arsenical copper appear to be surprisingly heterogeneous. One kind of relatively pure arsenical copper is likely to originate from the Slovakian or Saxon-Bohemian Ore Mountains, or Southeast Europe. Another group might contain Copper from alpine sources. The deposition of objects made in this strand of tradition was discontinued around 3500 BCE.

From the late 4th millennium onwards, flanged copper axe blades and Remedello daggers found in the necropoles of the Pianura Padana and occasionally around the Alps were made using copper that closely resembles the earlier arsenical copper. However, according to the isotopic ratios this copper stems at least partly from southern Tuscany. Influenced by these metallurgical innovations in the South, new metallurgical hotspots in the Western Alps emerged and set the scene for further metallurgical developments in the Swiss Plateau until the early Bronze Age.

Our analysis of 4th millennium BCE metallurgy paints a complex picture of discontinuous, possibly ephemeral innovation processes.

3 NEW RADIOCARBON RESULTS AND STONE AGE ECONOMICS: NEOLITHIC FLINT MINES AND HYPOGEUM BURIALS FROM VERT-LA-GRAVELLE AND SAINT-GOND (MARNE), FRANCE

Author(s): Edinborough, Kevan (University of Melbourne) - Martineau, Rémi (Université de Bourgogne; CNRS) - Shennan, Stephen (University College London)

Presentation Format: Oral

Here we present new radiocarbon results sampled from the Marne region of France, and focus on the implications of results obtained from recent excavations at the site of Vert la Gravelle, directed by Rémi Martineau. We find that where measured by radiocarbon, most activity at these Neolithic sites overlaps in time, although mining activity at the Neolithic site of Vert-la-Gravelle starts significantly earlier. We highlight where OxCal and CalPal radiocarbon calibration models are in agreement, and explain the key differences between these analytical techniques. We then shed new light on the temporal relationship between mining activity, and the hypogeum based burial activity within the mines themselves. In the light of new results from the Leverhulme Trust funded Neomine project based at the Institute of Archaeology University College London <https://www.ucl.ac.uk/neomine/> we discuss the economic implications of this activity, in the context of wider patterns of settlement and exchange in the surrounding region.

4 NEW PLANTS – NEW PEOPLE? FIBRE FLAX AND IMPROVED YARN PRODUCTION DURING THE 4TH MILLENNIUM BC IN THE CIRCUM-ALPINE AREA

Author(s): Karg, Sabine (Free University of Berlin) - Joshi, Jasmin (Hochschule für Technik Rapperswil) - Grabunzija, Ana (Free University of Berlin)

Presentation Format: Oral

Excellent preservation conditions in wetland sites located in the circum-Alpine area allow studying plant material in detail. We measured flax seeds from 40 Neolithic wetland sites, in order to identify if this useful plant (*Linum usitatissimum*) was cultivated for the purpose of oil and/or fibre extraction. Today specialized varieties exist: a big-seeded flax that is used for oil production and a small-seeded flax for fibre production. The results of the measurements of the ancient flax seeds clearly show a change in size around 3500 BC. The change in seed size was detected in both proxies, the uncharred and the charred flax seeds.

This result matches perfectly with the observation that in the archaeological context textile tools increased in number and variety during the 4th millennium BC as well. We therefore hypothesize that a new breed of flax was introduced into the Alpine region and that this new fibre crop boosted the production of new items made of flax. However, the question when and where the fibre flax was developed is still unknown. We tested if textile tools might answer this question. Large datasets of spindle whorls from two wetland sites in Southern Germany and Switzerland were analysed and the results were compared with a dataset from East Central European sites. The results indicate that thread production in the Alpine area was practiced by indigenous people and most probably also by a group of people belonging to a different socio-cultural background. In our lecture we want to discuss the possibility that immigrants introduced the new flax breed together with a new textile technology.

5 SLOW FOOD AND FAST CHANGES

Author(s): Mueller, Johannes (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

Within the CRC1266 "Scales of Transformations: Human-Environmental Interaction in prehistoric and archaic societies" continuities and discontinuities of societies e.g. of the northern European plain are analysed in respect to social transformation.

Beside global triggers of change, local and regional mosaics of transformations and translations describe the active role, humans played in transformation processes of the 4th millennium BCE. Events, processes and structures are visible

- in the adaption and non-adaption of copper metallurgy as a social technology;
- in the construction of cooperative societies as a result of agrarian innovations,
- and in the creation of individuality as a result of political separation within small communities.

In our model the continued subsistence economy (slow food) forms the base for rapid reactions on innovative potentials from outside and inside of the societies (fast changes). The hypothesis are verified both in northern Loess areas (Central Germany: Baalberge to Corded Ware), and in the northern and western moraine landscapes (TRB).

6 THE FOURTH MILLENNIUM BC TIMELINE OF THE UPPER RHINE PLAIN: CURRENT FACTS ABOUT THE MICHELBERG, MUNZINGEN AND HORGEN CULTURES

Author(s): Jammet-Reynal, Loïc (Archéologie Alsace, UMR 7044 Archimède - Université de Strasbourg) - Charnot, Marie (UMR 6298 - Université de Dijon) - Vergnaud, Luc (Antea-Archéologie, UMR 7044 Archimède - Université de Strasbourg)

Presentation Format: Oral

As a result of the growth of large-scale rescue excavations, it is now possible to put forward two distinct sequences in the considered area through ceramic styles. In the North, mainly in Lower Alsace, the Michelsberg culture appears at the end of the fifth millennium BC. One of its most distinctive features are undecorated round-bottom ceramic shapes whose origin can be traced back to the West (Paris Basin). The Michelsberg is later followed by several stylistic stages more specific to the Upper Rhine and the Neckar Valley (Munzingen B and C), which can be compared to the Pfyn ceramic vessels of Eastern Switzerland. After 3600 BC, the documentation is lacking. Some rare finds can however be linked with the ceramic productions of the Paris Basin, especially the Seine-Oise-Marne culture.

The South is less affected by Michelsberg influences, but is by contrast inspired by the pottery styles of the western Swiss Plateau (Cortailod culture). Therefore, another stylistic group of indigenous origin appears at the beginning of the fourth millennium from the Kaiserstuhl hills to the Mulhouse urban area: the Munzingen A. From 3300 BC onwards and after a short gap in the sequence, a pottery style native from the Swiss Plateau takes over from the Munzingen: the Horgen culture.

The aim of this paper is to itemize this timeline through the example of the most recent field discoveries. The historic meaning of these stylistic changes will be also enquired, by broadening the reflection to the funerary practices and the pottery making techniques.

7 WELL CONNECTED – MOBILITY IN SETTLEMENT COMMUNITIES IN THE NORTHERN ALPINE FORELAND (3950-3550 BCE)

Author(s): Heitz, Caroline (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research) - Stapfer, Regine (Archäologischer Dienst des Kantons Bern; University of Bern, Institute of Archaeological Sciences, Prehistory) - Hinz, Martin (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research) - Thierrin-Michael, Gisela (University of Fribourg, Department of Geosciences) - Affolter, Jehanne - Wehren, Helena (University of Bern, Institute of Archaeological Sciences, Prehistory) - Emmenegger, Lea (Archäologischer Dienst des Kantons Bern) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Centre for Climate Change Research)

Presentation Format: Oral

Neolithic wetland sites in the Northern Alpine Foreland dating to the 4th M BCE provide an extraordinary data basis to study forms of (cross)regional connectedness. Since 2016, in the SNSF-project 'Mobilities, entanglements and transformations in Neolithic societies on the Swiss Plateau (3900-3500 BC)', we have addressed those phenomena by analysing styles and materials of pottery and lithic tools from dendrochronologically dated wetland sites. By adopting a newly elaborated mixed method approach, we have applied qualitative and quantitative methods of archaeology and archaeometry: impressionistic and computer-aided pottery classification, thin section and (p)XRF, XRD and SEM analyses as well as macroscopic petrographic provenance determination of lithic tools. Thus, in the rhythm of decades, multiple regimes of mobility and triggered transformations in production and consumption practices of things could be approached:

Settlement communities at Lake Constance and in Upper Swabia were strongly entangled at the end of the 40th c. BCE. In contrast, entanglements intensified to Neckar, the Kraichgau and the Kaiserstuhl regions in the 39th c. BCE. Communities at Lake Zurich were connected with those in the Trois-Lacs, South Alsace, Lac de Clairvaux and Saône regions at the end of the 39th c. BCE. It was not until the middle of the 39th c. B.C. that these older networks of relationships gradually disintegrated in favour for northeast-oriented relations. In Central Switzerland entanglements show ties to the regions of Trois-Lacs, Lake Zurich and South Alsace at 39th to 37th c. BCE. However, the communities in the Trois-Lacs region were more connected with Eastern France

during that time period. These results on pottery can be contrasted with those of flint tools.

The examinations of directions and ranges of changing entanglements made different regimes of mobility visible, each referring to various supra-regional, multidirectional networks of relationships.

8 LAUSANNE-VIDY: FROM SINGLE TO SOCIAL?

Author(s): Jungnickel, Katharina (Gent University)

Presentation Format: Oral

Chamblandes burials were classified during the 19th century, and later radiocarbon-dated to the Neolithique Moyen (4500-3500 B.C.) within Switzerland and parts of France and Italy. Earlier research suggested that collective burials developed within Chamblandes stone coffins in two distinct phases: first, only single burials in a stone coffin never reopened, later placing multiple and sequential burials by reusing the same coffin.

During my theses, I conducted studies on aspects of Chamblandes burials in Switzerland: first, a general comparison of burial sites, with a main goal of working out possible trends in treatment of entombed individuals concerning their age and sex.

As a follow-up analysis, the exceptionally well documented necropolis of Lausanne-Vidy - one of several sites of the late 5th to middle 4th millennium B.C. in Western Switzerland clustered around Lake Geneva - was studied for demographic as well as spatial and temporal distributions. As a Swiss key site, where single and multiple burials occur together, it constitutes an excellent data pool for understanding the ritual changes of that time.

Based on the anthropological data it was possible to study demographic factors and social structures of the burial community and giving additional information on the sequence of single and collective burials through time and space.

Generally, burials showed a large share of individuals deceased at a young age. While grave goods are rare within Chamblandes context, at Lausanne-Vidy especially children were buried with imperishable goods, mainly jewellery.

Based on the burials' distribution and density, combined with demographic data, it became clear that rather than graves embodying family relationships, the necropolis represents a village community.

Results showed that collective burials already start with the beginning of the necropolis, making a two phase model unlikely, and that there was almost no distinction in treatment regarding age or sex of the deceased.

9 PSEUDO-REGIONALIZATION? REFLEXIONS OF SUPRAREGIONAL NETWORKS IN SOUTHERN GERMAN POTTERY PRACTICES OF THE EARLY 3RD MILLENNIUM BC

Author(s): Gleich, Philipp (University of Basel)

Presentation Format: Oral

Until today Southern German Neolithic archaeology has been dominated by the culture historical approach, resting strongly on stylistic pottery analysis. For the early 3rd Millennium BC scholars have defined multiple regional „culture groups“, often divided by modern political borders, being suggestive of regionally distinct and separate stylistic developments.

The presentation is trying to shed light on supraregional entanglements beyond the borders of the scholarly defined “cultural entities”. For this purpose, a practice theoretical approach is chosen. Accordingly, pottery making actors are not just „adopting“ new styles and techniques but are modifying and renegotiating them depending on what they have already learned.

Methodologically speaking several widespread stylistic and technical pottery features are chosen based on their frequent occurrence in Southern Germany and the neighboring areas. In a next step a detailed analysis of the local pottery production of some showcase sites is performed to see how these supraregional features are copied, modified or declined in local pottery practices.

In this way a richly textured picture emerges which is not one of sharply bounded „cultural areas“ but one of personal mobility and different negotiation processes within local and regional “communities of practice”.

It is argued that in the early 3rd Millennium BC a dense cultural network connected communities between South Western Germany in the west and Lower Austria in the east. The characteristic pottery features were not accepted everywhere in the same way and cultural peculiarities of the fourth millennium are persisting in some regions. Nonetheless communities participating in this network started to change. Frequent finds of cord decorated pottery sherds on sites of the so called “regional groups” of the early 3rd Millennium BC raise the question if this network even facilitated the spread of subsequent large-scale phenomena like the “Corded Ware Culture”.

10 SAME BUT DIFFERENT: CROSS-REGIONAL CULTURAL ENTANGLEMENT DURING THE FIRST HALF OF THE 3RD MILLENNIUM BC – A VIEW FROM FRANCONIA

Author(s): Link, Thomas (State Office for Cultural Heritage Baden-Wuerttemberg)

Presentation Format: Oral

The established archaeological map of the late 4th and early 3rd millennium is characterized by numerous cultural groups, most of them quite regionally confined if compared to the larger-scale entities of the Younger Neolithic. However, common elements of material culture can be traced across most of these regional groups and clear distinctions or delimitations are hard to be made. A closer look also reveals substantial gaps in the picture: archaeological data is virtually absent from some regions. The re-

gionalized character of the Late Neolithic rather seems to be a product of research history than a reflection of prehistoric reality. Franconia (northern Bavaria/northern Wuerttemberg) is one of the regions with only scarce evidence for the period in question. Some recent excavations however - especially at the hill-top settlement of Burgerroth - give new information. Close similarities in material culture with neighboring regions in the south (Goldberg III), east (Cham, Řivnač) as well as in the north (Bernburg, Wartberg) raise questions concerning inter-regional connections and cultural relations, which inevitably lead to some basic considerations on the nature of archaeological 'groups' in the Late Neolithic. Surprisingly, Late Neolithic elements seem to be present until the mid-3rd millennium and associated finds of Corded Ware settlement pottery point to parallel existence of regional Late Neolithic traditions and Final Neolithic innovations.

11 TRANSMISSION OF CULTURAL ELEMENTS IN THE LATE STAGE OF THE KRIVODOL-SĂLKUȚA-BUBANJ HUM COMPLEX IN R. NORTH MACEDONIA

Author(s): Spirova, Marina (Archaeological Museum of Macedonia)

Presentation Format: Oral

The 4th M BC brings a lot of changes within the Late Chalcolithic culture on the territory of the Republic of North Macedonia. Unlike the early phase where contacts between the communities can be traced both east/northeast and north, during the late stage the cultural interactions with the neighboring regional groups from the north seem to dominate. This transfer of ideas and new elements introduced transformation of the material culture.

Several occurrences of elements from northern regional groups have been documented in horizons belonging to the late stage of the regional Shuplevec-Bakarno Gumno group, as part of the larger Krivodol-Sălkuța-Bubanj Hum complex. Migrations in the Danube region have resulted in displacement of the population of several regional groups in the central Balkan region and subsequent movement toward the south. They are the carriers of new, previously not found elements in the material culture that correspond to the Kostolac-Koțofeni horizon in the Morava valley.

Evidence of long-distance exchanges can also be found in the material from the Late Chalcolithic. Some of these elements are of the so-called steppe origin - like the zoomorphic scepter and the Schnur decoration (corded ware) of the pottery, typical of Cernavodă I.

This presentation aims to contribute to a better understanding of the changes in the material culture, by looking at the pottery typology and decoration techniques, as well as the changes within the figurine production. The introduction of these new elements also corresponds to transformations in the spiritual life of the Chalcolithic communities and the abandonment of the ritual practices and ritual sites used during the previous phase of the Chalcolithic. The presentation also reflects on the close ties that this group had with neighboring cultures.

12 INTERPRETATION OF CHANGE. TRIGGERS AND EFFECTS OF NEOLITHIC TRANSFORMATIONS IN THE WESTERN BALTIC REGION

Author(s): Brozio, Jan Piet (Institute of Pre- and Protohistoric Archaeology CAU Kiel)

Presentation Format: Oral

Various distinctive phases of economic and social transformations have been identified in northern Germany and southern Scandinavia during the 4th millennium B.C. These include phenomena such as neolithization and the building of monumental architecture in the form of megalithic tombs. The socio-cultural developments and changes associated with these phenomena are related to different forms of intensive use of the natural surroundings as well as to quantitative and qualitative changes in material culture.

While the first half of the 4th millennium B.C. was characterised by the beginning of landscape structuring by non-megalithic long-mounds and sporadic arable farming, stronger and more diverse phenomena can be observed in its second half. These include a boom in megalithic tomb building, an increasing opening of the landscape, and the introduction of important technological impulses like the ard. At the transition to the 3rd millennium B.C., these phenomena began to dissolve and new forms of expression developed. Altogether, these phenomena can be observed in different manifestations and on different spatial scales.

This talk presents the results of diachronic quantitative analyses from a subproject of the Collaborative Research Center "Scales of Transformation" (CRC1266) related to the 4th millennium B.C. in northern Germany with a focus on the southern Cimbrian peninsula. The aim of the presentation is to describe different phenomena of transformations and to identify possible triggers and effects of socio-cultural changes in neolithic societies.

13 THE INTRODUCTION OF MONUMENTAL LANDSCAPES IN SOUTHERN SCANDINAVIA IN THE 4TH MILLENNIUM - A NEW WORLD OF STRATIFIED POLITIES

Author(s): Artursson, Magnus (Swedish National Historical Museum)

Presentation Format: Oral

Excavations of the last two decades in southern Scandinavia have started to reveal the complexity of monumental landscapes in the 4th millennium BC. Monuments placed in small groups as well as large sites of many monuments were part of the landscape indicating a stratified society. It is important to recognize that these sites have been formed over time, thus undergoing change in social importance over generations. A stability as for location is seen at several sites, although this does not necessarily mean

inheritance within the same families or clan over several generations. Altering older monuments may also have been a way of taking over a hierarchical position. Thus, it is the social and political positions that are manifested at these sites, not necessarily tied to the same families or clans over time.

Mobilization of labor and surplus of staples was necessary to maintain regular feasting events at the monuments and at the central gathering sites. Historical and anthropological research shows that a leadership structure characterized as big-man societies or simple chiefdoms must have been necessary to mobilize and manage the economic surplus. Construction of monuments and organization of feasting organized by a big-man or chief probably represented the social and political position, which determined ownership of associated ceremonies and rituals, e.g. the social capital. The regular feasting events accompanied ritual activities preoccupied with ancestral cult and fertility.

Consequently, the Neolithic monuments in Southern Scandinavia can be seen as the physical manifestations of social capital and labor used by local and regional leaders to establish selected places with ritual and emotive significance. Early forms of property rights instituted new sociopolitical institutions with rights to monopolize and utilize surplus for local and regional leaders. Supra-regional contacts provided the upper strata of society with high status objects to manifest their social position.

14 THE CULTURAL AND ECONOMIC TRANSFORMATIONS IN THE STEPPE PART OF THE VOLGA-URAL REGION IN THE IV MILLENNIUM BC

Author(s): Evgenyev, Andrey - Morgunova, Nina (Orenburg State Pedagogical University)

Presentation Format: Oral

According to the paleosoil researches at the settlements and barrows in the period of 3800-3300 cal. BC in the territory of the Volga-Ural interfluvium the aridization of the climatic situation occurred. The beginning of this period coincides with formation of the Pit-Grave (Yamnaya) culture. The materials of the early stage of the Pit-Grave culture show many signs of continuity from the Hvalynsk and Samara cultures of the Eneolithic era. But there are significant changes in economy and the spiritual sphere. In the economy the transition to the nomadic type of cattle breeding and formation of the metallurgical production on the basis of the Ural copper ore fields is observed. The social inequality is born, which is reflected in the funeral rites. The burials under barrows of different size are spreading. The special rituals allocate the burials of clergy. Metal products accompany the burials of the leaders. At the end of the IV millennium BC burials with wooden wheel vehicles appear.

Acknowledgement: The work is supported by the Task No. 33.1389.2017/PP of the Ministry of Education and Science of the Russian Federation.

15 SHOW - SHARED WORLDS: REVEALING PREHISTORIC SHARED WORLDS ALONG EUROPE'S ATLANTIC FAÇADE

Author(s): Higginbottom, Gail (Incipit, Consejo Superior de Investigaciones Científicas; University of Adelaide; Australian National University)

Presentation Format: Oral

This talk will discuss the Marie Curie project SHoW that is being carried out at Incipit from 2019-2021, as well as previous striking results that led up to this project. This project will produce insights into some of the most iconic representations of cultural remembrance in Europe, revealing the degree to which the people in regions across Europe possessed shared worlds. Specifically, it investigates the types of visual-scapes people chose for the erection of their megalithic monuments within and across regions, that clearly seem to have some kind of related megalithic tradition, but which is not yet understood. Focusing on the periods of intensive monument building in prehistoric Iberia (c. 4500-2500 B.C.) and Britain (3100-900 B.C.), innovative 3D technology, along with other interdisciplinary approaches, will assist in the reconstruction of past visual worlds of the megalith builders of Europe. By identifying and interpreting how megalithic monuments were used and placed, along with considerations of associated material culture, it will be possible to better comprehend the relationships or understandings between social groups from the 4th M BC until the late 2nd millennium. Initial results and previous outcomes from Britain, through to northern Iberia and France will be discussed.

16 THE STABILITY OF THE FACTORS AND INTERPRETATION OF RITUAL FEATURES OF BELL BEAKERS FROM NORTH-EASTERN POLAND

Author(s): Klecha, Aleksandra (The Antiquity of Southeastern Europe Research Centre University of Warsaw) - Manasterski, Dariusz (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

Because of their strong semantic meaning, archaeological finds of ritual character are a perfect illustration for the conceptual variability of the interpretation. In this case, four features of Bell Beakers from the Supraśl 3 site in north-eastern Poland were used as an example for investigating. Relicts of most likely Iberian origin, were composed of quite similar, partly repetitive sets of artifacts, of which each was quite unique. All of those deposits contained fragments of identical, very characteristic ornamented pottery, amber artifacts, as well as stone and flint tools.

However, only some were equipped with a small amount of burnt bones or a limestone. Despite many common aspects of the features e.g. a characteristic ritual procedure related to a specific selection of arte- and ecofacts, with the location of the site, items deposited in Supraśl differed in many respects like category, typology, raw material, state of artifacts' preservation and

fragmentariness of those.

In many cases a clear repeatability of those attributes could not be detected. The finds underwent numerous analyses, showing how many circumstances have to be considered during archaeological investigation, what the consequences of omitting some of them are and finally how the perspective is changing when applying a new methodological approach.

The stability of those explanatory factors and its implication on the archaeological proceeding have become an inspiration for the model of ritual feature interpretation. The main purpose was to emphasize the number of factors having a significant impact on the later conclusions, divided in two major categories: human impact and environmental conditioning, both now and in the past.

Assuming that the Bell Beakers had a significant influence on local hunter-gatherers societies, what can be well observed on the pottery fragments, recognition of all circumstances of those finds and their appearance are very important in the archaeological interpretation.

A. POLISHED TO SHINE: FIRING EXPERIMENTS TO REPRODUCE BLACK CERAMICS

Author(s): Stapfer, Regine (University of Bern, Institute of Archaeological Sciences, Prehistory; Archäologischer Dienst des Kantons Bern) - Heitz, Caroline (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Center of Climate Change Research) - Thierrin-Michael, Gisela (University of Fribourg, Department of Geosciences, Archaeometry Group; University of Bern, Institute of Archaeological Sciences, Prehistory) - Surdez, Morgane - Katona Sernaeels, Ildiko - Serneels, Vincent (University of Fribourg, Department of Geosciences, Archaeometry Group) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences, Prehistory; University of Bern, Oeschger Center of Climate Change Research)

Presentation Format: Poster

In the course of studies on ceramics from Neolithic wetland sites of the Northern Alpine Foreland dating between 3900-3500 BC (MET-project), several groups of vessels with shiny dark surfaces were distinguished. The hypothesis formed concerning their production technique is, that the surfaces were polished or burnished before firing in reducing atmosphere at low temperatures (colour due to carbon). In order to establish whether this or other techniques were used, the archaeological ceramics were analysed by polarisation microscopy, XRD and SEM coupled with XRF-EDS. Macroscopically, the fabrics of the ceramics showed some differences in colour and zoning pattern. In every instance, however, while signs of compaction were observed on the outer portion of the sherds under the microscope, no zoning was detected in the chemical and mineralogical compositions from surface to core. This strengthened the hypothesis that the sheen was achieved by polishing alone and that no coatings were applied.

This was further tested by several experimental firings of small tiles and vessels. The test samples were prepared from different raw materials collected around studied sites and partially polished in the leather hard state. Some were simply placed in an open bonfire. The others were covered by a large earthenware pot together with wood shavings and the fire built around in order to maintain a reducing atmosphere throughout the firing including the cooling phase. Firing temperatures measured by thermocouples placed in different positions reached 950°C in the open bonfire, 650°C under the large pot. In both types of firings, temperatures were held over 600°C for only about 30 minutes. Sherds matching the archaeological samples in colour, fabric and surface sheen were the result. As expected, shiny surfaces comparable to the archaeological sherds were obtained only on polished sections of the vessels and tiles; best results were achieved under completely reducing conditions.

B. IN THE NEIGHBOURHOOD OR NOT? THE SOCIETIES OF THE FUNNEL BEAKER CULTURE AND THE BADEN CULTURE IN LESSER POLAND

Author(s): Zastawny, Albert (Archaeological Museum in Kraków, Poland) - Brzeska-Zastawna, Agnieszka (Institute of Archaeology, Jagiellonian University, Kraków)

Presentation Format: Poster

The development of the Funnel Beaker culture (FBC) in the south-eastern Poland (Lesser Poland) had lasted for about 1000 years: 3900-2900 BC. In the earlier stage of this period, i.e. from about 3500 BC, the influences of the Baden complex could be observed in the culture (in Boleráz stage and further Early Classic stage), coming from the south, from the area of today's Moravia and south-western Slovakia. Over the next 200 years or so, these influences intensified and as a result they considerably changed the FBC. The presence of the Baden traits is so significant that the culturally mixed assemblages are called the Funnel Beaker-Baden assemblages (FB-B). Their development dates back to the period between 3400-2900/2800 BC. Regardless of the cultural influences of the Baden complex on the FBC, in the western part of Lesser Poland the enclave of the settlement of the proper Baden culture (Late Classic phase) was established. Its origin is connected with a direct migration of human groups from the Carpathian Basin, whilst the development of the settlement took place between 3100-2900 BC. These two Lesser Poland Eneolithic units – the FB-B and the Baden culture occupied neighbouring areas. In the classical evaluation of the relationship between the two, the view of the co-existence prevails, which is also indicated by the radiocarbon dating. But do all archaeological data suggest such chronological order? The issue will be tackled in our presentation.

C. THE NEOLITHIC TIMES IN THE REGION OF LISBON (PORTUGAL): WHAT CHANGES AND REMAINS IN THE 4TH MILLENNIUM BCE

Author(s): Sousa, Ana Catarina (UNIARQ, Center for Archaeology of the University of Lisbon)

Presentation Format: Poster

At the westernmost part of Europe, the Lisbon region is an elongated narrow strip of land located, encompassing highly differentiated physical and human landscapes. Flanked by the river Tagus basin on the East and by the Atlantic Ocean on the West, presents a geologic favoured a solid preservation of organic matter, a feature that turned the Estremadura into a key area for understanding aspects of ancient peasant societies in Iberia.

The archaeological research in the Lisbon region dates back to the 19th century, having then been identified most of the megalithic tombs and fortified prehistoric Chalcolithic settlements. More recently, early Neolithic contexts have been identified and excavated indicating early neolithisation (mid 6th millennium). The available information allows a diachronic analysis of the evolution of peasant societies from the 6th to the 3rd millennium. In the middle of the 4th millennium, Late Neolithic, a very rapid change happens in the patterns of settlement and technology, but it is in funerary practices that the greatest changes occur, with the advent of the first megalithic funeral practices.

The main changes attested in the 4th millennium will be presented in a long-term perspective, crossing several scales of analysis: the local analysis in a natural region of the Ribeira de Cheleiros (Mafra, Sintra), regional area in the Lisbon region and supra-regional in the Center and South of Portugal.

252 IN SEARCH OF CLOUDSTONES*? LITHIC RAW MATERIAL PROCUREMENT IN MOUNTAINOUS AND ALPINE REGIONS DURING THE MESOLITHIC AND NEOLITHIC

Theme: Archaeology of mountainous landscapes

Organisers: Cornelissen, Marcel (Archaeological Service of the Canton of Grisons; Universität Zürich, Institut für Archäologie, Prähistorische Archäologie) - Nyland, Astrid (Archaeological Museum, University of Stavanger)

Format: Regular session

Access to lithic raw materials was central to hunter-gatherer and early farming societies of the Mesolithic and Neolithic periods. In alpine and mountainous regions, knowledge of where and how to access lithic raw materials was key for effective resource exploitation and in extreme instances, for survival. However, the sometimes monumental, physical impact of quarrying and people's apparent willingness to travel long distances to procure rock from particular sites, imply that quarrying, procurement sites, and rocks, had social significance too. That is, quarries and procurement sites may have been social arenas or persistent social nodes.

Lithic raw materials exploited in mountainous terrains include types such as chert, quartz, rock crystal, quartzites and radiolarite, all of which are suitable for the production of chipped stone artefacts. Although quarries and other procurement locations securely dated to the Mesolithic/Neolithic are rare, analysis of raw material variation at (settlement) sites can be used to gain insight into the variety and scale of lithic sources exploited. Together, this demonstrates different procurement strategies throughout the Stone Age. Varying intensities and methods of persisting, seasonal, and event-like exploitation, are probably closely related to general landscape use, climatic conditions, mobility patterns, and various social contexts.

What does lithic raw material procurement in the montane and (sub-)alpine zones tell us about Mesolithic and Neolithic economies or social organisation? What was the social significance of these lithic raw materials, these "cloudstones" as commented on by Edmonds and Ferraby (2013)? What can apparent familiarity with perhaps otherwise largely unchanged, natural places reveal about social aspects of these various communities? Did limited access to specific raw materials influence technological developments? There are many gaps in our knowledge, and we invite speakers to explore these with us through case studies or syntheses.

* Edmonds, M. and Ferraby, R. 2013. Stonework. Group VI Press.

ABSTRACTS

1 CLOUDSTONES, RAW MATERIAL EXTRACTION AND USE IN MOUNTAINOUS LANDSCAPES. AN INTRODUCTION

Author(s): Cornelissen, Marcel (Universität Zürich, Institut für Archäologie, Prähistorische Archäologie) - Nyland, Astrid (Archaeological Museum, University of Stavanger)

Presentation Format: Oral

Both archaeology as well as art and poetry try to understand what it is to be human. In their book "Stonework" and by introducing the term "cloudstones", Mark Edmonds and Rose Ferraby (2013) demonstrate how closely related the two main qualities of stone raw materials, and act and location of extraction can be. Socio-political and aesthetic qualities of stone on the one hand, and the stones' functional aspects as well as the choices made concerning lithic raw material extraction on the other are often intertwined. During the last 150 years, the interest in quarries and raw material extraction has shifted from trying to determine the (prehistoric) origins of quarry sites to include both extraction activities and the distribution of the extracted material, as well

as the socio-political role of these quarries and raw materials. Recently, more elusive and spiritual qualities of lithic raw materials have also come to the fore.

In this introduction, we will briefly introduce these central themes of research into raw material extraction and use in the Mesolithic and Neolithic in mountainous landscapes through its research history. We will then place the contributions within the context of this framework and this session.

2 COASTAL AND ALPINE SETTLEMENT DYNAMICS DURING THE MESOLITHIC AND NEOLITHIC IN WESTERN NORWAY

Author(s): Åstveit, Leif Inge (University Museum of Bergen) - Årskog, Hanne (University Museum of Bergen)

Presentation Format: Oral

The Lærdal Mountain plateau is situated 1100-1500 masl in Southern Norway. Geographically the drainage divide between east and west runs in this area and this highland also represents the border between Eastern and Western Norway. The area is well known for its large reindeer herds and good hunting ground. A vast number of Stone Age sites together with quarries and outcrops of quartzite have been detected here. Since the 1960s the University Museum of Bergen has conducted numerous excavations in this area, seven in the last ten years. The investigations indicate varying intensities in use of this landscape through time. In this paper we use three different sets of data to shed new light on the dynamics and utilization of the mountain sites:

- Radiocarbon dates and site studies from Lærdal.
- Demographic big data proxies from the coast of Western Norway based on 6-700 radiocarbon dates from the Mesolithic and the Neolithic.
- Climate studies based on variability in glacial activity and vegetation history during the Holocene.

A primary goal is to compare demographic fluctuations detected at the coast and variations in the utilization of the mountain resources. Finally we will discuss why people sought this alpine area in the first place.

3 QUARRYING INTO THE “CHARISMA OF THINGS”? MOUNTAIN QUARRYING AND RAW MATERIAL USE IN THE MESOLITHIC AND NEOLITHIC OF WEST-NORWAY

Author(s): Nyland, Astrid - Bang-Andersen, Sveinung (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

In the mountains of West-Norway there are both quarries and settlement sites that evidence the procurement and utilization of a variety of fine-grained quartzites and crystal quartz. The use of these distinctive raw materials however, varies both regionally and temporally. Their appearance in the archaeological record can be examined in contrast to that of flint, a material that needed to be transported into the mountains. It is understandable to find flint in regions with a restricted range of locally available and suitable rock types, but why do we find flint in regions rich in “flint alternatives”?

Focusing on two case studies, we will examine procurement practices in different parts of the mountain plateaus of West-Norway. The first deals with quarrying activity and the distribution of crystal quartz within the upland interior of Rogaland County, a region where flint is by far the most commonly utilized rock. Moving north of the Hadangervidda plateau, a second case study examines the exploitation and distribution of fine-grained quartzite from two large quarries situated c.1300 m.a.s.l. in Lærdal and Hemsedal, at the watershed between Sogn og Fjordane and Hemsedal Counties.

Variations in quarrying practices and the distribution and frequency of raw materials can, when contextualised, widen our understanding of developments in the use of different landscapes, resources, and mobility patterns in the Mesolithic and Neolithic periods. These insights allow us to consider the more intangible aspects of Stone Age lifeways including ontological questions concerning the “charisma of things” and human/rock/place relationships.

4 THE ROLE OF THE NORTH ROE RIEBECKITE FELSITE QUARRY COMPLEX IN THE NEOLITHIC OF SHETLAND

Author(s): Cooney, Gabriel (School of Archaeology, University College Dublin) - Megarry, William (School of Natural and Built Environment, Queen's University Belfast)

Presentation Format: Oral

A distinctive feature of the Neolithic in the Shetland Islands, off the north coast of Britain is the dominance of a single geological source, riebeckite felsite, for the production of stone axes and also Shetland knives. Since 2013 the North Roe Felsite Project has been using an integrated, multi-scalar approach to investigate the character of the quarry complex and its wider role in Neolithic society in Shetland.

The quarry fits into the category of lithic procurement strategies being examined in this session as it is situated in northwest Mainland, the highest part of the Shetland archipelago. While the highest point, Ronas Hill, is only 450m high, because of the island location and climatic conditions this is equivalent to much higher mainland mountainous areas on the mainland. The sub-arctic climatic conditions would have had an influence on quarrying and procurement strategies.

It appears that the quarry was in use for over a millennium (from before 3,500- 2,500 BC) - the duration of the Neolithic in Shetland. Evidence from the quarry complex indicates that extraction was embedded in ritualized extraction processes and that the quarry landscape was developed as a special place. Our focus is now turning to the wider role of the quarry in the establishment

and development of Neolithic society in Shetland.

- 5** **CRYSTALS FROM THE ICE. LATE MESOLITHIC ROCK CRYSTAL EXTRACTION AND USE IN THE CENTRAL SWISS ALPS**
Author(s): Cornelissen, Marcel (Universität Zürich, Institut für Archäologie, Prähistorische Archäologie; Archäologischer Dienst des Kantons Graubünden)
Presentation Format: Oral
- Seeking for rock crystal, or “Strahlen” has a tradition reaching back many centuries in the central Swiss Alps. Although the use of rock crystal for artefact production in the region during the Neolithic and Mesolithic has been known for some decennia, the actual remains of rock crystal extraction have remained extremely rare here as well as in the rest of the Alps. Near the mountain pass “Fuorcla da Strem sut”, such an extraction site was discovered after it melted free from the Brunnifirn glacier in 2013. Organic finds from the site were dated to the very end of the Mesolithic. The site puts the assemblages of rock crystal artefacts of the region in a new light. Furthermore, it provides insights into hunter-gatherer and early agropastoralist habitation of and raw material use in the subalpine and alpine zones. These can subsequently be compared with other parts of the Swiss (Pre-) Alps where we have some knowledge of raw material use. Lastly, it allows new insights into past and present glacial and climatic changes and their impact on hunter-gatherer archaeology as well as procurement archaeology of the (sub-)alpine zones.
- 6** **CONNECTING SITES: APPLYING PXRF ON FLINT FROM EARLY MESOLITHIC DWELLINGS WITHIN THE STORA MYRVATNET COMPLEX IN ROGALAND, NORWAY**
Author(s): Eilertsen, Krister (Museum of Archaeology, University of Stavanger)
Presentation Format: Oral
- Can we by applying new technology to Mesolithic material trace interaction between sites? Pending on the results, the application of pXRF to compare flint types could lead to establishing relationships between sites and tracking the people who procured, knapped and used stone tools by tracking movements of the material itself between sites in a certain area. It would also give an alternative dating to the sites that lack other ways of determining age.
- On the shores of Lake Stora Myrvatnet, located approx. 600 m.a.s.l. in Rogaland, Norway, a number of dwelling sites have been located. These sites are among the earliest documented sites in the country, and a newly discovered Early Mesolithic site at Lake Stora Myrvatnet expands the previously known settlement complex. Flint is the most dominant raw material, although rock crystal, quartz and quartzite are represented as well. Most of the raw material procurement would have been from the coastal shores of Norway, as flint does not appear naturally in the bedrock.
- In order to establish potential relationships between dated and undated sites, as well as demonstrating potential contemporary settlements around the lake, I have initiated a pilot study of flint. In it, the elemental composition of visually similar looking flint is compared, making this a qualitative rather than quantitative analysis. pXRF analysis will then be initiated on the selected artifacts. Flakes and flake axes from four sites are being examined in the analysis.
- Connecting sites at Myrvatnet through raw material analysis will provide new insights into the exploitation of raw materials and the social organization. Not only within this complex in the mountainous Early Mesolithic environment, but also shed light on procurement along the western coast of Norway.
- 7** **EARLY HUNTER-GATHERER ROUTES IN THE HIGH CENTRAL ANDES SEEN THROUGH AN OBSIDIAN LENS**
Author(s): Rademaker, Kurt (Michigan State University) - Reid, David (Field Museum of Chicago)
Presentation Format: Oral
- We review archaeological evidence for the earliest obsidian transfers by hunter-gatherers in the Central Andes to explore land use and mobility during the initial settlement of South America. Despite being relatively small, localized geologic features located within rugged, high-elevation mountain landscapes, Peru’s three major obsidian sources had been discovered and were being transported long distances by the Terminal Pleistocene and Early Holocene. Early use of mountain obsidian sources is not restricted to the Central Andes but is demonstrated at multiple sites along the western cordilleras of the Americas. The discovery and use of mountain obsidians therefore appears to have been a regular feature of the early settlement phase of the Americas.
- Our least-cost analysis explores possible routes of hunter-gatherer mobility and interaction between obsidian sources and sites to which obsidians moved via direct acquisition or exchange. Even least-cost transfers suggest travel across considerable topographic relief and high elevations (>4000 m above sea level). These patterns imply that hunter-gatherers were intimately familiar with high-elevation landscapes and resources by 13,000-12,000 years ago throughout the Central Andean region. Once discovered, use of these resources persisted and amplified throughout the Holocene as enduring markers of long-distance social connections.

WHERE DID THE ROCKS GO? REFLECTIONS ON LITHIC RAW MATERIAL RESOURCE MANAGEMENT IN THE EASTERN ALPS, AUSTRIA

Author(s): Brandl, Michael (Austrian Academy of Sciences, OREA-Institute, Vienna) - Bachnetzer, Thomas - Leitner, Walter (Institute for Archaeologies, University of Innsbruck)

Presentation Format: Oral

Prehistoric settlement dynamics in the Alps have become a specific focus of archaeological research. Besides pastoral economy, the diversity of resources available in the high Alps can be considered as one primary factor triggering the colonization of the Alpine realm. Since the appearance of prehistoric people in the Eastern Alps, they engaged in targeted prospection activities in search for raw materials. Especially the rich sources of high quality lithic raw materials suitable for chipped stone tool production, predominantly chert, radiolarite and rock crystal, were used since the Paleolithic and more intensively during Mesolithic and Neolithic times. During the latter, we see the increasing use and exploitation of primary sources, all of which are located in remote places oftentimes difficult to access.

Recent investigations conducted in the western parts of the Eastern Alps in present-day Austria have demonstrated the potential of this extensive source region for inner alpine resource management strategies during the Stone Ages on various scales, revealing early procurement spheres, exchange networks and transalpine supply routes. However, although several quarrying sites of high quality materials have been detected, it appears that East Alpine lithic resources played only a minor role in the developing raw material supply networks. In this contribution, we will present selected quarrying- and campsites in the Eastern Alps of Vorarlberg and Tyrol, and attempt an interpretation of the possible underlying economic and societal reasons for this at first glance rather surprising phenomenon.

PUBLISHING IN INTERNATIONAL, PEER-REVIEWED ACADEMIC JOURNALS

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Witcher, Robert (Antiquity) - Nilsson Stutz, Liv (Archaeological Dialogues)

Format: Workshop

Publishing in international, peer-reviewed journals can be a challenging process for researchers at all career stages: PhD students, early career researchers and experienced scholars alike. Each journal has different article formats, its own evaluation criteria and broader objectives in relation to the content that it publishes. Manuscripts submitted for consideration therefore need to be tailored to the specific requirements and audiences of each target journal. The Editors of Antiquity and Archaeological Dialogues, Dr Robert Witcher and Dr Liv Nilsson Stutz respectively, will lead a workshop to guide prospective authors through the publishing process. They will provide insights into each step of the process, including working up initial ideas and structuring articles, the submission, peer review and editorial decision-making processes, and post-acceptance editing, publication, publicity and metrics. The session will provide practical guidance on how to improve your chances of publication in a selective journal by avoiding common errors and by taking simple steps to ensure that manuscripts address the key criteria that reviewers are asked to evaluate. The workshop will include time for questions and answers.

SPAS: A CULTURAL PHENOMENON IN THE MIRROR OF PRESENT ARCHAEOLOGICAL AND INTERDISCIPLINARY RESEARCH

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Schaer, Andrea (Archäologischer Dienst des Kantons Bern; Berne University; Kantonsarchäologie Aargau) - Boisseuil, Didier (Université de Tours, Dept. d'histoire et d'archéologie) - Schaub, Andreas (Stadtarchäologie Aachen)

Format: Regular session

Mineral springs and spas have been part of the European landscape and culture since Greek and Roman antiquity. They are highly specialized settlements dependent on the natural resource of mineral water.

Spas combine the use of the healing waters with religious or metaphysical ideas and actions, medical treatment and finally leisure – the otium. They are places of contemplation, encounter, communication and exchange between humans. Visiting a spa and “taking the waters” means to physically and mentally leave your home and your daily life with its conventions and duties and to adapt for a certain time to a different rhythm of life. Spas therefore may be considered as Europe’s first tourist destinations.

As time goes by, the religious and philosophical ideas, the social environment and the physical and social needs of the spa’s guests change. Even so change the material culture, infrastructure, architecture and urban character of spas – and also the archaeological remains.

Starting point of the discussion is the recent research at the spa town of Baden (Switzerland): initially a roman Aquae which became the most prominent spa in the German Empire from the Middle Ages to the Renaissance. Since 2006 large-scale archaeological excavations form the backbone of an interdisciplinary research project that unites archaeologists, historians and engineers. The research at Baden follows a diachronic approach with the goal of understanding the history and development of the spa from the beginning until today.

The session aims at giving an insight of the different scientific approaches and the present state of research at Baden and other spas in Europe and to put these in the wider context of the cultural phenomenon of spas.

As spa culture lives on, it shall also be reflected upon how archaeology and the material and intangible heritage of spas can become an asset for their future.

ABSTRACTS

1 FROM AQUAE TO BADEN: THE ARCHAEOLOGY OF 2000 YEARS OF BATHING HISTORY AT BADEN (CANTON AARGAU, SWITZERLAND)

Author(s): Schaer, Andrea (Archäologischer Dienst des Kantons Bern; Archaeokontor GmbH; Berne University)

Presentation Format: Oral

The sulphurous springs of Baden in the Swiss Canton Aargau were for nearly 2000 years the most popular in Switzerland. In roman times the thermae of Aquae Helveticae welcomed visitors from near and far. From the middle ages to the 17th century Baden was the most famous spa in the German Empire and visited by kings, queens and the clergy as well as by wealthy citizens of nearby Zurich and visitors from all over Europe. So to speak, Switzerland's first touristic hot (s)pot were hot waters at Baden! The numerous literary sources and the rich historical tradition make Baden an important reference for historians, geographers – as well as for archaeologists.

The fact that the spa town Baden did not develop to the same extent in the 19th and early 20th centuries as did other spa towns saved many archaeological remains and historical buildings from undocumented demolition and loss. Between 2009–2012 and 2018, two campaigns of rescue excavations were carried out before the extensive construction work for a new thermal spa takes place. These excavations unearthed impressive remains of the roman thermae and the ruins of the medieval and modern baths before only known by the written sources. The archaeological findings therefore not only prove, precise and illustrate the known historical facts but they also shine a new light on medieval and early modern bathing culture.

The presentation gives a short introduction to the Baden research project. Then it focuses on the archaeology of the medieval and modern bathing facilities and the urban development of the spa precinct throughout the second millennium AD.

2 THE ANCIENT THERMAL BATHES OF AQUAE GRANNI (AACHEN)

Author(s): Schaub, Andreas (Stadtarchäologie Aachen)

Presentation Format: Oral

Excavations in the last years throw a new light on the spa town of Aachen/Aquae Granni. Covering a surface of approximately 11'000 square meters, the thermal baths at Aachen were one of the largest in antiquity. In the surroundings of the baths developed one of the largest civil settlements in the southern part of the Germania Inferior.

Archaeological record and an imperial building inscription indicate the existence of a forum. It is possible that Aachen/Aquae Granni was the capital of a Civitas. In recent years, archaeological evidence proved the continuity of the settlement from Roman times to the Early Middle Ages.

In spite of the literary tradition that Charlemagne used the thermal springs (Einhard, Vita Karoli Magni), the archaeological research in this respect is still in its infancy. So is the research on the subsequent bathing activities up into the Early Modern period.

As the knowledge of the appearance of late Roman-medieval Aachen is constantly growing, the meaning and continuity of Aachen's baths can be understood. The baths are location factor number one and therefore the reason for the foundation of the roman settlement and its prosperous urban development as well as for the choice of Aachen as royal and imperial residence (Pfalz). Aachen was not only the coronation place of German kings but also became one of the most important pilgrimage cities of the old world.

3 FROM ROME TO THE PRESENT. DIACHRONIC AND INTERDISCIPLINARY RESEARCH INTO THE HISTORICAL SPA OF LUGO (SPAIN)

Author(s): González Soutelo, Silvia (UAM / MIAS)

Presentation Format: Oral

The Roman spa of Lugo is a clear testimony of the history of thermalism as well as of the many vicissitudes witnessed by these thermal spas over the centuries.

For more than 2000 years its mineral-medicinal waters were exploited and used, whilst different infrastructures were created. Linked to its historical context, these infrastructures have evolved and transformed the remains of the Roman spa which is still preserved inside the modern building.

Due to the historical importance of this spa, declared a building of Cultural Interest in 1931, a Master Plan based on interdisciplinary research was drawn up. This project has allowed a deeper understanding of the historical evolution of this building. The archaeological documentation has been completed with other studies carried out by specialists in such diverse areas as hydrogeology, medicine, anthropology and architecture, which has allowed a diachronic analysis of this complex. Consequently, the patrimonial heritage of this spa has been enhanced, showing the importance these waters had in the immediate surroundings.

In this presentation we will put forward some of the results from this experience, focusing our proposal on the lines of work de-

veloped over the last years to integrate and understand both this and other spas in the context of European thermal heritage as well as in the international researches on this subject.

4 **BATHING ON UNSTABLE GROUND: THE ROMAN THERMES AT BADEN (CANTON AARGAU, SWITZERLAND) AND ITS WOODEN SUBCONSTRUCTIONS**

Author(s): Held, Julia - Streit, Sonja (Kantonsarchäologie Aargau)

Presentation Format: Oral

In addition to "From Aquae to Baden: The Archeology of 2000 years of bathing history at Baden (Canton Aargau, Switzerland)" this presentation focuses on the Roman remains from the thermae "Aquae Helveticae".

As a result of construction attendance since 1960 and the excavations between 2010-2012, several buildings from the Roman thermal bath complex were documented: Three large bath-houses, containing basins, a large building with sequence of dry hot rooms (laconicum), and a building serving as steam bath (sudatorium).

During the summer of 2018 a large-scale rescue excavation added new informations to the overall development of the Roman thermae in Baden.

Due to the unstable subsoil, the Roman constructors had to find an adequate foundation to ensure a long durability of the buildings. To support the overlying structures, they made use of timber piles for the deep foundations builded massive wooden subconstructions.

Layers of clay protected these wooden foundations. As a result the state of preservation of the organic material is extraordinary. Not only can the wooden subconstruction been study in its detailed compositions, but even the traces of the wood working tools were still visible.

The first part of the presentation will give a short summary of the Roman bath complex and its development. In a second part, there will be a more detailed insight into a wooden subconstruction with a rarely seen preservation.

5 **SPAS AS A MEETING POINT FOR CULTURES: THE CASE STUDY OF ROMAN SPAS IN THRACE**

Author(s): Avramova, Mariya (The Antiquity of Southeastern Europe Research Center, University of Warsaw)

Presentation Format: Oral

Roman province of Thrace encompassed terrains with multiple mineral water springs. Near some of them Romans built spas, which were used throughout antiquity, the Middle Ages, the Ottoman period and some of them until present day. Archaeological research has established that most healing settlements were related to a sanctuary of diverse gods. Often, they were well-known figures from the Greek pantheon like Asclepius, Hygeia and Apollo, whose names are discovered in various inscriptions. Alongside them were found votives dedicated to Thracian deities like the Three Nymphs of whom we know quite little, but who are mentioned in many inscriptions found in spas and their surroundings. It seems possible that by studying the votive monuments from spas we can learn more about the nature of those settlements and their role as a meeting point between the Roman and Thracian culture. The paper addresses the matter from the point of view of religious life in spas in Roman Thrace on the basis of case studies of healing settlements from different parts of the province.

6 **ITALIAN SPAS IN THE MIDDLE AGES**

Author(s): Boisseuil, Didier (Université de Tours)

Presentation Format: Oral

At the end of the Middle Ages, healing waters in the Italian peninsula have been intensively exploited for therapeutic and recreative purposes. The use of springs has led to the development of thermal sites or districts and the formation of spas, inhabited and occasionally fortified. It has also generated a real "termalismo" : a cultural phenomenon with singular social practices. The intervention will detail the main features of the improvements made : the occurrence of infrastructures (basins) and buildings (inns, hospitals) ; it will underline the initiative of the public authorities - the rural and urban communes like the princes - in the development of the sites and their control ; it will finally clarify the role of phicisians in the valorization of springs. Practitioners have, indeed, largely contributed, in the peninsula, to elaborate a true discourse on the baths - perceptible through a singular literature : de balneis treatises - and to forge the norms of the cure that have gradually spread to the whole of Europe.

259 **THE CREATIVE REINTERPRETATION OF MATERIAL CULTURE IN PREHISTORIC SOCIETIES: A REAPPRAISAL**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Ballmer, Ariane (University of Bern) - Neumann, Daniel (Lower Saxony State Museum Hanover)

Format: Regular session

A broad range of archeological artifacts whose physical appearance obviously diverges from the initial characteristics of the related object category are known. This intentional and explicit transformation can either manifest (a) in the physical alteration of objects themselves, or (b) in the actual manufacture of entirely new objects mimicking the 'originals' (such as for instance ceramic house models, clay axe heads, or miniature bronze swords). By means of formal adaption, extreme under- and oversizing, or the choice of peculiar materials etc., the original use is prevented in favor of a repurposing, and the altered objects' differentness

is excessively pronounced, and yet still strongly referring to the 'originals.'

The overt social significance of these object variations seems unquestionable. In the past, catchwords like 'icon', 'idol' or 'fetish' have been applied, and concepts involving 'object worship,' 'symbolic currency,' and 'votive object substitutes' have been proposed. This obvious reduction of the social reality asks for a thorough reappraisal of the widespread phenomenon in the light of the complex entanglement of people and things.

This session focuses on the many facets of physically altered and transformed objects and their archeological contexts throughout prehistory. We aim to explore the archeological phenomenon of creative reinterpretation and set it into a wider, interdisciplinary theoretical framework, discussing both the practice of transformation, and the role/s of the transformed objects themselves, and most importantly the relevant human-thing relations. Papers dealing with pertinent examples and case studies from the Paleolithic to the Iron Ages, as well as theoretical discussions are welcome.

ABSTRACTS

1 THINGNESS AND HISTORY

Author(s): Robb, John (University of Cambridge)

Presentation Format: Oral

What is a thing? This question is surprisingly complicated. There are two broad answers. One focuses upon specific material objects; this is common in archaeology, museum studies, and some forms of material culture analysis. In this sense, an object's biography is the continuous trajectory of a specific material object, including production, circulation and exchange, use, repair, reuse and repurposing, and disposal; the category to which the object belongs can be taken for granted. The other tradition focuses upon objects as constructed through frames of discourse and meaning, rather than actual materials. This is common in history, anthropology, social theory, and studies of 'intangible heritage'. Both answers are useful for specific problems, but neither is adequate. Instead, we need to look at thingness as a relational frame for capturing specific material components flowing through time and binding them into an emergent entity. (This is a straightforward extension of DeLanda's assemblage theory, viewing thingness as a relationship which allows new capacities to emerge when components are recognised as belonging to a particular kind of assemblage). This theory gives us the basis for defining the material processes characterising thingness. These are often archaeologically recognisable. This argument is illustrated with examples from European prehistoric "art", including examples which persist, examples which vanish and become mere material components, and examples which are redefined and morph into other things through a long historical trajectory.

2 SKEUOMORPHS IN BRONZE AGE RITUAL PRACTICE. MATERIAL REALITY AND THEORETICAL APPROACHES

Author(s): Ballmer, Ariane (University of Bern)

Presentation Format: Oral

This paper addresses the specific category of skeuomorphs [i.e. artefacts formally mimicking archetypical objects by ostentatiously emphasizing their characteristic features, yet not serving their original function] from archaeological contexts being linked to Bronze Age ritual activities, such as isolated depositions, sanctuary-like gathering places, and burials. However, the deeper meaning of these objects remains elusive. Here, the skeuomorphs' strategic involvement in ritual practice will be tackled, including their deliberate production, use and discard.

Relevant theoretical approaches from ritual studies to cultural anthropology as well as object-oriented ontologies allow important insights into a variety of evident aspects, such as the skeuomorphs' power as aesthetic media, their symbolic status, their metaphorical potential, their exigence for performance, their asymmetric relationship with their archetypes, their processual and transformative quality, and eventually their role in the formation of a 'new truth' (Harman 2018). With this referential framework in mind, the archaeological situation around skeuomorphs must be reconsidered: confronted with a revised, nuanced terminology, the peculiar artefacts can be contextualized within a web of prehistoric social circumstances.

3 THE CREATIVE REINTERPRETATION OF AXEHEADS: THE USE OF JADEITITE AND OTHER ALPINE ROCKS

Author(s): Sheridan, Alison (Dept. Scottish History & Archaeology)

Presentation Format: Oral

Axeheads made of jadeitite and of other Alpine rocks (notably omphacitites and fine-grained eclogites) provide a classic example of an artefact type that acquired a symbolic meaning over and above its original functional meaning as a tool for felling trees and working wood. Axes were a necessary tool for farming communities and many hundreds of thousands were produced. But clearly certain axes (or axeheads) acquired an enhanced social value as iconic objects, with the axeheads' raw material coming from special locations - here, high in the North Italian Alps - and being imbued with divine power. The ways in which the numinous power of these special axeheads was constituted are explored: rarity, toughness, colour, shape, surface finish, treatment and deposition. The extraordinarily wide distribution of the axeheads from their source areas, and the complex life histories of certain examples, are investigated. This presentation uses the results of Prof. Pierre Petrequin's Projet JADE and JADE2 to explore the creative reinterpretation of the humble axehead.

4 **BEYOND THE POLISH: SWEDISH POLISHED STONE AXE MICROWEAR ANALYSIS AN EXAMPLE OF MATERIAL MANIFESTATION OF CHANGING IDEOLOGIES**

Author(s): Debert, Jolene (University of Lethbridge)

Presentation Format: Oral

This paper will present the preliminary findings of one of the first systematic microwear examination of Southern Scandinavian polished stone axes. Just before the start of the Neolithic in the region polished stone tools appear. We know this period brought considerable change; not just to subsistence, human occupation of landscape but also how they viewed their landscape and their place within it. Polished axes are a well-preserved material manifestation for this changing world. As materials are not simply the structured residues of acts, but were integral to the changing traditions that we seek to investigate.

Research from the Netherlands suggests that their axes were never intended for used; instead, they were revered, and only removed from their protective wrappings at important festivals (Wentink, 2008, Wentink and van Gijn, 2008). This study sought to explore the possibility that Swedish axes were similarly treated. The outcome of this research was twofold. Firstly, I was able to confirm the transformative process the Scandinavian axes went through during polishing and establish that it was possible to identify where this ended and usewear began. Secondly, it was possible to identify a proportion of the axes studied that did not contain felling wear, but instead had wear indicating a wrapping.

Finally, this paper will examine how implicit knowledge, habitual practice and material culture may be seen as forms of cultural inheritance, which are not merely the outcomes of human action, but the media through which human projects are carried forward. This paper will provide opportunity to delve deeper into the shifting world of the early Neolithic and provides insight into the alternating ideology, and material manifestation of changes in identity.

5 **ORIGINALS AND COPIES: FROM IMITATION TO MINIATURIZATION (NEOLITHIC PERIOD- EARLY BRONZE AGE)**

Author(s): Marangou, Christina (Independent researcher)

Presentation Format: Oral

Recreating physical things in diverse materials or/and in altered sizes involves a transposition process, conceivably entailing different functions of the copies, be they utilitarian or fictional, a combination of both not being excluded.

If the real or imaginary functionality of a reproduction diverged from that of its prototype, it is to be debated:

- whether a convenient morphology was intentionally selected and imitated because of its concrete advantages, fortuitously referring to real or fantasy images;
- or if a theme was depicted because of its symbolic potential, although the resulting morphological characteristics were consecutively exploited for practical purposes, different or not from those of the original;
- or even if a blend of initial symbolic and utilitarian qualities was pursued on the same recreated and transformed object.

Besides different materials used, the choice of imitation scales varying from the diminutive to the monumental is obviously significant. Reduced reproductions might sometimes even be further subdivided in clusters of size, possibly implying varying concrete uses and/or symbolic functions and roles of the copies.

The paper endeavours to examine the social significance of Neolithic and Early Bronze Age examples, mainly from Northern Greece, in archaeological contexts suggesting human – thing relations.

6 **UNDER AND OVERSIZING? THE DELIBERATE PRODUCTION OF INEFFICIENCY OF COPPER AND BRONZE AGE METAL OBJECTS**

Author(s): Neumann, Daniel (Lower Saxony State Museum)

Presentation Format: Oral

From the European Copper Age and Bronze Age metal objects are known which seem to be non-functional on the one hand, but mimic objects which could be really used on the other hand. This may be achieved by excessively enlarging or miniaturising artefacts or by the casting of parts which are usually made from organic material – e. g. the combined casting of axe and shaft. These replicas were mainly found as deposited objects which underline their social and economic significance.

This paper will present some examples of these artefacts in particular and will contextualize them within the archaeological record. This examination will be a starting point to approach the cultural phenomenon of creating replicas on a more general and theoretical perspective as using replicas or miniatures in rituals or funerals is a widely known human social practice. A critical discussion and reappraisal of this phenomenon in the archaeological debate is necessary as in contrast to other categories of artefacts these metal objects have been assumed to be precious and supposed to contain symbolic meaning without exception. Besides such an identification the social meaning of this practice was only cursorily addressed in the archaeological debate.

7 **CEREMONIAL SWORD OF EARLY NOMADS OF EURASIA: CONCEPTUALIZATION OF THE OBJECT**

Author(s): Topal, Denis (University of High Anthropological School; National Agency for Archaeology)

Presentation Format: Oral

The overwhelming majority of finds of ceremonial swords and daggers (i.e. decorated with gold and put in the special context) of the Iranian world are associated with aristocratic burial complexes, including “stray finds”, which, probably, originate from the

destroyed burials. Apparently, the closest practice of conspicuous consumption for the Iranian nomads became the funeral one, for which the weapon turned into ceremonial. It is easy to see that the Iranian ceremonial weaponry, found in hoards is located outside the nomadic world and possibly designates its borders for various periods. And the very tradition of ceremonial swords, placed in a funeral context, pulsates throughout the history of Iranian-speaking nomads. The context of its appearance is the fading practice of deposition of the swords and daggers in hoards, linked to the traditions of Late Bronze Age. Then the tradition of “golden swords” is actively manifested in the Scythian time and after a while, it is revived in the Sarmatian period. In the Scythian epoch, the tradition of ceremonial swords is accompanied by chronological lacunae that run between the main links of the periodization chain. Despite the fact that the maximum number of ordinary Scythian swords and daggers (in full accordance with the Gauss’s Law) falls on the Middle Scythian period, the bulk of ceremonial forms refers to the finale of the classical Scythian culture — the “Golden fall” of Scythia with its huge royal burial mounds and an abundance of gold, illustrating the thesis that such conspicuous consumption coincides with periods of political instability and crises.

8 REDUCED MODELS AND MINIATURES BRONZE WEAPONS: A VIEW FROM EASTERN ARABIA

Author(s): Gernez, Guillaume (Université Paris 1 Panthéon-Sorbonne)

Presentation Format: Oral

In recent years, the discovery of reduced models and miniatures bronze weapons has increased in Eastern Arabia. Dated from the Iron Age (1300-300 BCE), these objects come mainly from artisanal contexts and/or associated with ritual practices. In a culture where writing is almost unknown at this time, the social and functional significance of these objects and their contexts remain very complex to address.

However, based on data from recent excavations, including Mudhmar in Oman, where many elements related to archery (bows, arrows, quivers) were discovered, we will attempt to draw up an inventory of interpretive possibilities, and to place them in a broader perspective that includes the entire Middle East over the long term, addressing the human/object relationship from the point of view of ritual practices in relation to the initial (design and production) and final (deposition) stages of altered weapons, and everything that can happen between these two moments.

9 A REAPPRAISAL OF MINIATURE OXHIDE INGOTS FROM LATE BRONZE AGE CYPRUS

Author(s): Meneghetti, Francesca (Goethe University, Frankfurt am Main)

Presentation Format: Oral

During the Late Bronze Age, the Eastern Mediterranean was connected by long-distance trade networks, in which various commodities circulated. Copper was amongst the most requested goods. In this scenario, from the 15th century BC till the end of the Late Bronze Age, Cyprus played an important economic role, as the island became the main copper exporter for the Eastern Mediterranean region.

The export of Cypriot copper occurred mainly in form of oxhide ingots. They were rectangular slabs with projections at each corner, being on average 30 kg heavy and between 50 cm and 80 cm long. Oxhide ingots were so pivotal in Late Bronze Age Cyprus to become part of Cypriot material culture. In fact, representations of oxhide ingots appeared in this period on different media, like cylinder seals, bronze four-sided stands and statuettes. Similarly, due to their shape, miniature oxhide ingots seem to belong to this phenomenon.

Fourteen miniature oxhide ingots come from Late Bronze Age Cypriot contexts. They differ from standard-size oxhide ingots, especially for dimensions and weight as they are between 2 cm and 11 cm long and they are between 4 g and 240 g heavy. Interpreted as votives, weights or recently as copper samples, miniature oxhide ingots from Cyprus have always attracted the attention of the scholars. However, the past analyses did not explain or overlooked their reduced dimensions and other peculiar features.

After sixty years since the first contribution by H. G. Buchholz (1959), a revision of the material seems necessary. Therefore, the paper aims at re-examining both archaeological contexts and previous interpretations of Cypriot miniature oxhide ingots to give a fresh overview of the objects and their function.

10 CREATIVE REINTERPRETATION OF FUNERARY LANDSCAPE IN MIDDLE TO LATE BRONZE AGE TRANSITION IN THE SPAČVA BASIN

Author(s): Malovoz, Andreja (Udruga za arheološka istraživanja spačvanskog krajolika; Heidelberg University)

Presentation Format: Oral

Nineteen recently discovered mounded cemeteries in the Spačva Basin provide a case study for the funerary landscape reinterpretation and its creative redefinition in the Middle to Late Bronze Age transition. While the new tumuli continued to outwardly mimic the old, the process of their inner construction grew evermore complex through increasingly frequent, prolonged and engaging celebratory events. The visually most striking feature of the new funerary practice was the selection and reassembling of colourful natural materials, fragmented man-made objects and cremated remains in the course of the mound building process, coupled with the enduring custom of raising large fires on top of the completed tumuli to signal their closing. Despite drawing on a range of materials in the construction of the horizontal divisions within the mounds, when it comes to the spatial organisation of the variously coloured layers, the people continued to copy the initial stratification which was to be found in the surrounding natural landscape. With the stratigraphic layers, thus, taken up in space but retaining the mutual organisation of the original context, it is likely that the differently coloured layers signified the upraised sub-strata and the fires implied the upraised funeral

pyres, thereby exposing the practitioners to structural elements which concerned the vertical rearrangement and creative reinterpretation of their environment. If, in this way, people's organising instinct recreated the landscape anew inside each mound, the planes of construction could have transmitted the idea of a unified design and allowed for the simultaneous interpretation of the mounds and the surrounding landscape as extensions of each other, keeping current and meaningful the relationship between the group and their environment in the times of change.

11 BRONZE AGE TRANSFORMATIONS, LONG DISTANCE EXCHANGE AND GUEST-FRIENDSHIP

Author(s): Kaul, Flemming - Frei, Karin (The National Museum of Denmark)

Presentation Format: Oral

Imported objects are often seen as a main stimulus in the creation of new types. The creative process of transformation may have taken place somewhere in between the primary sources of inspiration and the areas where new types turned up, here swiftly spreading in new and translated shape. The appearance of the one-edged razor with horse headed handle in South Scandinavia shortly before 1400 BC provides an example. The Nordic razors are one-edged and asymmetrical, whereas other European razors of the time are two-edged and symmetrical, except for Aegean/Minoan razors. The Nordic razors are smaller than their Mediterranean prototypes. Whereas the handle with its horse's head is fully cast on the Nordic razors, the handle of the Aegean razors is flanged, being partially of organic material. Still, the full shape of the handle is visible on votive razors from the Dicte Cave, Crete.

Recent developments in strontium isotope analyses have allowed scientists to trace the mobility of single individuals in detail. Some individuals buried in Denmark (14th Millennium BC) stayed for long time far from here, probably Central Europe. Lead isotope analyses evidence that copper extracted in the Alps, reached South Scandinavia. The most distant connections are demonstrated by glass beads, turning up in the North c. 1400 BC, coming from Egypt and Mesopotamia.

The ancient Greek (and Homeric) concept of guest-friendship, *xenia*, may give us an idea of the social mechanisms that would make long distance exchange practically feasible. *Xenia* was a concept of hospitality and friendship of individuals of non-related groups and was a moral and religious obligation of hospitality securing food and accommodation to travellers. Some stations on the routes could be in the Alps, where dialogues and exchange of ideas took place while feasting and drinking practices according to the rules of *xenia* were respected.

12 WARRIOR IDENTITIES AND EARLY NORDIC BRONZE AGE DOUBLE GRAVES. THOUGHTS ON A PECULIAR DOUBLE GRAVE FROM KARLSTRUP, DENMARK

Author(s): Walsh, Matthew - Reiter, Samantha - Kaul, Flemming - Frei, Karin (The National Museum of Denmark)

Presentation Format: Oral

Throughout history alternative gender identities and categories have been integral to social groups that are highly-performative and/or rigorously hierarchical, as e.g. within martial fraternities. Here, we open up for an alternative interpretation of a same-sex double grave from the Early Nordic Bronze Age from Denmark. We suggest the possibility that the so-called 'warrior elite', may have embodied a distinctive and recognized gender category, based on individual mobility and dynamic fraternal relationships. We suggest that male identities may have been more complex than may be hypothesized from a gender-normative notion of masculinity. Double graves indicate a significance to the intimate relationship between the deceased as recognized by the living, yet these relationships have always been assessed from a heteronormative perspective. We propose that the warrior lifestyle may have included intimate interpersonal relationships between men as part of the shared warrior ideology and that such relationships would have been a recognized feature of the warrior elite. To investigate this hypothesis, we look at features of a same-sex male double grave from Karlstrup, Denmark and compare it with other Nordic Bronze Age double burials. We develop how this particular grave, while mimicking the standard schema for double graves of the period – i.e. those of 'blood-brother' warriors or husband-wife couples, etc, may reflect a social reality for both the deceased and the living that was quite different from these prototype identities. For context, we draw insights with evidence from, among others, Classical and anthropological literature. We offer a brief discussion of why gender-related interpretive frameworks are of value to our understandings of the archaeological record, and provide another layer of information offering a deeper understanding of prehistoric societies and individuals' potential social mobility in the past.

13 TRANSFORMATIVE OBJECTS: RETHINKING WEAPONS IN VIKING AGE FEMALE GRAVES

Author(s): Gardela, Leszek (Department of Scandinavian Languages and Literatures, Bonn University; Department of Archaeology, History, Cultural Studies and Religion, Bergen University)

Presentation Format: Oral

Around fifty Viking Age female graves with full size and miniature weapons have been identified across Scandinavia in the course of the ongoing project entitled "Amazons of the North: Armed Females in Viking Archaeology and Old Norse Literature" (DAAD P.R.I.M.E 2018-2019). Each of these graves displays unique characteristics as regards the treatment of the body, the deployment of objects and overall composition. While it may be tempting to interpret all women buried with military equipment as warriors or powerful female chieftains – an idea that has been previously proposed by several scholars – there exist alternative ways of understanding the meaning of weapons in these very specific funerary contexts. By looking at the complete corpus of all relevant graves from Scandinavia, this paper will seek to demonstrate intriguing patterns that begin to emerge from this material, and by situating this evidence in the context of Old Norse textual sources and folklore, an attempt will be made to

nuance previous ideas about the connections between women and weapons in the Viking Age. This paper will seek to argue that weapons in the Viking Age could have more applications than just in physical combat, and that in the minds of Norse women and men they could be reinterpreted, transformed and effectively used for many different purposes.

A. UNUSUAL TERRACOTTA OBJECTS FROM THE NEOLITHIC AND ENEOLITHIC PERIOD IN NORTH MACEDONIA

Author(s): Kolistrkoska Nasteva, Irena (Archaeological Museum of Macedonia, Skopje)

Presentation Format: Poster

Through researching the prehistoric settlements from Neolithic and Eneolithic period on the archaeological sites in North Macedonia were excavated various findings – artifacts, majority of them are clay potteries, various terracotta objects of worship, tools made of bones and stones.

Unusual objects are the terracotta ‘altar tables’ which are always surrounded by large number of animal bones, as leftovers from their own food given as offering. Some samples are with concave surfaces and I recon they were filled with liquid for libation.

Interesting creations are clay models of a houses which are unique findings, especially in our region (Vardar and Pelagonia Valley). Rectangular form of the model of the house with the flat roof and sometimes with the gable roof, different shapes of holes (as doors or windows) is confirming the actual ‘in situ’ remains which are discovered trough the excavations. The lower part is representing the ‘original’ object, depicting the home and above it is a symbolic vision of the housekeeper – ‘Women/Mother’. The creator never forgets to present the ‘Ladies’ on the top of the houses with interesting hairdos, necklaces, earrings and bracelets. Those object compositions (almost half of meter high) are often found near to the fireplaces and occasionally placed on the pedestals.

The knowledge received from the stated findings, which are subject of this poster presentation, clarifies one segment of the inhabitants’ lives from Neolithic and Eneolithic Period, in fifth and the fourth millennia BC. Chronologically, these findings belong to the local cultural group Šuplevec- Bakarno Gumno and more widely to the Bubanj-Salkutča-Krivodol cultural group.

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DECONSTRUCTION OF PREHISTORIC ECONOMY: VALUE, BARTER AND INTERPRETATION OF NON-MONETARY FINDS IN ARCHAEOLOGY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Tóth, Peter (Department of Archaeology, Masaryk University) - Pokutta, Dalia (Department of Archaeology, Archaeological Research Laboratory, Stockholm University) - Gralak, Tomasz (Institute of Archaeology, University of Wrocław) - Kuleshov, Viacheslav (Department of Archaeology, Stockholm Numismatic Institute, Stockholm University)

Format: Regular session

Archaic non-monetary systems and barter networks were resilient and successful form of economic interactions for millennia. Since the Paleolithic, Europe developed a system of value that came to play a unique role in world history. The existence of pre-monetary economy shows to what extent prehistoric institutions, and social relations evolved and actively transformed Europe, providing firm foundations for monetary systems in later times. Barter was at once a cornerstone of modern economic theory and an ancient subject of debate about political justice, from Plato and Aristotle onwards. As an idea ‘barter’ is part of the history of economics and archaeology, and the assumption that it was the forerunner of monetary exchange is crucial in the way it is normally conceptualised. The requirement of immediate satisfaction of demand is paramount in barter systems. This is one of the explanations of the rejection of monetisation in various prehistoric populations.

This session focusses on all aspects of prehistoric economy, excluding coinage. We welcome interdisciplinary cooperation of archaeologists, economists, statisticians, anthropologists and theorists, who together can focus on fundamental questions, which transcend national boundaries, bringing closer innovative ‘out-of-the-box’ understanding the economic foundations of prehistoric world. Session invites a broad range of theme-orientated contributions focussing on, e.g. creation of economic value, mathematic foundations of metric systems, theory of barter exchange, grain economy and surplus creation, trade related mobility studies, and interpretation of non-monetary finds. We particularly invite innovative contributions focusing on circulation of archaic ‘proto-currencies’, ancient monopolies, maritime trade and structure of credit transactions, economic aspects of slavery and human trade in the past.

ABSTRACTS

1 HOW SHOULD WE STUDY PREHISTORIC ECONOMY?

Author(s): Tóth, Peter (Masaryk University)

Presentation Format: Oral

According to Ian Hodder (1982), there are three basic approaches in analyses of human economic behavior in the past: substantivism, formalism, and social exchange. The substantivists tends to focus on relationships between people and on the different types of exchange mechanisms such as reciprocity, redistribution, and market systems. The formalism focuses on analytical techniques that would allow particular modes of distribution to be identified (e.g. regression analyses), assuming that universal concepts of economic theory - scarcity, maximization, surplus - are applicable in economic anthropology. Finally, social exchange

studies, mixing both formalism and substantivism, involve social strategies, and functional interrelationships, such as the availability of resources, and control over production.

Formal mathematical approaches to the study of prehistoric exchange are of value in that they allow a better description of functional relationships. In this presentation, I discuss spatio-temporal modeling as a method of choice able to interconnect social and economic processes of larger territories.

Spatio-temporal modeling relates to problems where we want to analyze and predict how something varies over space and/or time. Such problems can exist in widely different spatial and temporal scales. It is based on a gradual transformation of relative dating of archaeological sites into a temporal scale. As a result, each site has assigned a temporal uncertainty in a predefined temporal block. The transformed datasets can be used for more advanced analysis, such as an investigation of cultural, social and economic processes as well as a comparison of settlement dynamics by interpolation of temporal uncertainty. This background can be also used in subsequent agent-based modeling.

For archaeologists, the combination of spatio-temporal modeling and agent-based modeling can be very useful, because we can simulate and observe human behavior in changing social, economic, environmental and cultural conditions across space and time.

2 SUBSISTENCE STRATEGIES OF THE LBK SITE AT ŽÁDOVICE (MORAVIA, CZECH REPUBLIC)

Author(s): Cerevková, Alžběta (Moravian Museum, Czech Republic; Masaryk University)

Presentation Format: Oral

Site Žádovice (south Moravia) is a polycultural site with substantial settlement features dated to the LBK, the early phase (I) being the most pronounced. To this phase belong the most of the archaeologically detected features (such as ground plans of houses, burials). We are currently focusing on the reconstruction of subsistence strategies of the local early LBK community within the complex study of the site. Research is at the moment focused mainly on the anthropological material from burials. Their primary anthropological analysis has been already carried out (Čižmář – Geislerová 1998). Pathological signs of buried individuals (mostly children) are consistent with the consumption of a plant-based diet (teeth abrasion, anemia). This kind of diet is also confirmed by multiple finds of tools used for processing plants processing (grinding stones). Buried individuals are currently being dated by ^{14}C dating. The ratio of stable isotopes ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) is being established in order to reconstruct paleodiet. Present results of radiocarbon dating showed surprisingly old dates (6300–5600 calBC). Therefore it is necessary to obtain more ^{14}C data and do more analyses (for example aDNA) to establish the chronology and understand the economic and social aspects of the past community. It is worth considering whether the old dating could not have been caused by a certain kind of diet (such as reservoir effect caused by consuming fish). To verify this hypothesis the osteological material of domestic animals was analyzed (^{14}C dating). The exceptional character of site Žádovice might be emphasized by the atypical position in the landscape, which might have influenced the subsistence strategy of the local inhabitants. Results of this study may contribute to better understanding the way of life of the local community in the context of the LBK in Central Europe.

3 THE INDIVIDUAL IN THE ECONOMY: HIGH-RESOLUTION ISOTOPIC DATA FOR PALEODIET AND PALEOMOBILITY RECONSTRUCTION OF INDIVIDUAL LIFE HISTORIES

Author(s): Tóth, Peter (Masaryk University)

Presentation Format: Oral

Although human depositions in settlement pits are a well-known phenomenon within the Baden culture, very little is known about the day-to-day life of Eneolithic man, especially of deposited individuals. Therefore a closer look at the human skeletal remains from Hronovce (SW Slovakia) will be taken, which were acquired from the bottom of a settlement pit. They belonged to a female aged 35–45 years. Traces on the bones and teeth suggest pathological anomalies documenting degenerative-productive changes and inflammation processes. Radiocarbon dating of a fragment of a compact bone after calibration is 3350–3090 calBC (2σ), which falls within the period of classical Baden culture.

For the purpose of the quotidian life reconstruction, a series of high-resolution isotope analyses from teeth and bone was conducted, gaining a plastic picture of female's life from the childhood (age 3–5) to the early adulthood (circa age 21) and in the last years of her life. Residential mobility was studied by radiogenic strontium isotope data ($^{87}\text{Sr}/^{86}\text{Sr}$) getting a resolution of 10–12 week slot. This information is confronted with strontium isotope fractionation ($\delta^{88}\text{Sr}/^{86}\text{Sr}$) which is used to generate information about paleodietary practices. This knowledge connected with the light stable isotope data ($\delta^{15}\text{N}_{\text{col}}$ and $\delta^{13}\text{C}_{\text{col}}$) from the same female is used to consider geologic variability of food sources. With this novel approach weaning age can be estimated and seasonal variations of food in connection with paleomobility can be reconstructed.

Several studies showed that not all individuals had the same access to nutritional resources. Therefore social status of the female based on isotopic data was also estimated. Thus the individual life of the female from Hronovce (SW Slovakia) was successfully combined with the micro-economy of the Eneolithic household, proving the high-resolution isotope analysis as an invaluable tool to glimpse at the life of a particular individual.

- 4** **INDIVIDUALITY AND SOCIETY: STATUS OF INDIVIDUALS OF THE BELL BEAKER CULTURE AT THE BURIAL GROUND IN POPŮVKY (MORAVIA, CZECH REPUBLIC)**
Author(s): Cerevková, Alžběta - Hájek, Zdeněk (Moravian Museum, Czech Republic)
Presentation Format: Oral
- The burial ground of Bell Beaker Culture at Popůvky is a newly discovered site found during salvage excavation. Within the excavation 78 burials were found. This amount alone puts the site to one of the largest cemeteries of the Bell Beaker Culture known in Moravia. The burials were highly varied in regard to age, sex, and state of preservation of buried individuals, construction of the burial pit and also attested grave goods. We are currently focused on the question of the social status of the buried individuals within the local community and possibly to understand their potential contacts with the outer environment. Based on that research attention is given to the character of lithics (so-called "archer kit") and metal artifacts. The provenience of raw material, production technology, and life cycle of artifacts (via traceology) are of interest. Bone artifacts and artifacts made of amber are also analyzed in more detail. Variability of archeological remains of individual burials points out to the stratification of the society reflecting the individuality of a person. The main research question is how much are we able to define the relationship of the individual to the community and his/her status based on preserved burial rite, also how could this society function as a unit in a larger social environment of that time. Following these findings a preliminary model of the social-economic stratification of the population at Popůvky will be created, which will be tested on selected burial grounds of the Bell Beaker Culture in Central and Western Europe.
- 5** **THE FIRST EUROS? RINGS, RIBS, AND AXES, COMMODITY MONEY OF THE EUROPEAN EARLY BRONZE AGE**
Author(s): Kuijpers, Maikel - Popa, Catalin (Faculty of Archaeology, Leiden University)
Presentation Format: Oral
- During the Early Bronze Age large amounts of metalwork were exchanged. Some of this was deposited and ends up in hoards. The overall focus of the Economies of Destruction project at Leiden University is to explore the development of these hoarding practices, from 2300 to 1500 BC. Given that the accumulation of wealth is generally regarded as a universal way of achieving power and prestige, we would like to understand how a society can function when its members deliberately and systematically destroy wealth.
- This paper deals with a particular sub-project within this larger framework. Reassessing the substantial rings, ribs, and axe hoards in Central Europe, we test the possibility that these are the earliest occurrences of commodity money in Europe, north of the Alps. We use a novel methodology based in psychophysics to calculate perceived similarity based on weight and dimension. In this manner, we take on board that prehistoric currencies and weights systems, in the absence of measuring equipment, were approximations. We employ this methodology on a database of over 4000 rings and 1000 axes, the largest database to date on these objects.
- Test results show a clear perceptible equivalence between rings, ribs, and axes of the Early Bronze Age. Our findings report that up to 55% of these objects are perceptibly identical. While the rings and ribs are almost exclusively found in the Danubian region, axes circulated mostly in Middle Germany indicating that both regions produced local currencies. The occurrence of rings and axes together in hoards in the contact zone between these regions strengthen the idea that they serve a similar purpose as proto-currency and were largely interchangeable. We conclude that rings and axes were regionally specific articulations of a larger economic system of Early Bronze Age proto-currencies, based on shape and weight.
- 6** **PLANO-CONVEX INGOTS AND THEIR IMPORTANCE IN THE ECONOMY OF THE LATE BRONZE AGE**
Author(s): Modl, Daniel (Universalmuseum Joanneum)
Presentation Format: Oral
- Transforming raw metal into ingots created an easy way to transport the metal from the mining site and to establish standards in their trade. During the Early/Middle Bronze Age transition, the standardised ingots with fixed denomination, like neck-rings and rib ingots, were replaced with the heterogenous plano-convex ingot or casting cake (German: Gusskuchen) in Central Europe. In the Late Bronze Age, the plano-convex ingot, together with the ox-hide ingot, is the most common bar type for copper and their alloys in Europe and the Near East. It was formed in an open casting process by pouring molten metal into a shallow pit in the ground or in a specific casting form. Most of the plano-convex ingots from Late Bronze Age hoards are fragmented. This is the result of a targeted breaking in red-hot state, immediately after casting or after a later heating in a charcoal fire when they were traded, processed, hoarded or sacrificed. Several fracture patterns of plano-convex ingots or their weight ratios in European hoards suggest that these could embody a premonetary currency. How plano-convex ingots were possibly integrated into the Bronze Age weight-money system is the subject of present investigations.
- 7** **GRAIN ECONOMY, FOOD REGIMES AND AGRICULTURAL INNOVATIONS IN THE BRONZE AGE EUROPE (2800-1000 BC)**
Author(s): Pokutta, Dalia (Stockholm University, Dept. of Archaeology, Archaeological Research Laboratory)
Presentation Format: Oral
- The process of Neolithization in Europe and beyond generally can be seen as the emergence of very stable cultural adaptations;

pottery making and sedentary agriculture with stock breeding. Looking from the isotopic perspective, however, the same process resulted also in strong unification of dietary practices over millennia in the whole of Europe. The Neolithic diet was, in some sense "frozen in time", and did not evolve in any spectacular manner for centuries. The pottery traditions may have varied in distant regions of the continent, but the content of the dish was similar. Therefore complementary $\delta^{15}\text{N}/\delta^{13}\text{C}$ isotopic values can be found in Neolithic bone materials across the whole of Europe, from Britain to Greece and from Portugal to Russia.

The situation changed rapidly in the Early Bronze Age due to huge shifts in agriculture, through transmission of diverse organizational models, technologies, and socio-political traditions. The civilizational "success" of the Bronze Age was grounded on numerous choices that were made by individuals and communities in the process of deciding what to eat. The Bronze Age consumption model enabled meeting human needs and wants, introducing selectiveness, excessiveness and food taboos. This new model encompassed a broad spectrum of need fulfillment activities, including status acquisition, identity formation, and social class identification. The rapid growth of metal-using consumer societies was accompanied by agricultural productivity, promoting technical progress and the optimum utilization of labor. The isotopic data from the Bronze Age shows, therefore, higher variability and multidirectional regimes.

In this presentation, I will focus on dietary practices in several Bronze Age populations based on isotopic data covering ca. 250 individuals from my own research in recent years. The isotopic datasets cover, among others the Unetice Culture Group (Poland and Czechia; 2300-1600 BC), the Tumulus (1600-1200 BC), Trzciniec (1900-1200 BC) and Lusatian cultures (1300-500 BC).

8 COMMODITY TRADE VERSUS PRESTIGE EXCHANGE: THE ORGANIZATION OF BRONZE AGE ECONOMIES

Author(s): Kristiansen, Kristian (University of Gothenburg)

Presentation Format: Oral

This presentation use high resolution data from Thy in Denmark in the Early Bronze Age ca. 1500-1100 BC as a starting point for reconstructing trade networks and economic systems. Recent work on providing Big Data on population densities has provided new insight into volumes of trade in the Bronze Age. In tandem with isotopic data on the origin of metal and textiles it has revolutionised our understanding of the role long-distance commodity trade. How does this new insight correspond to previous models of prestige goods exchange, can we reconcile the evidence from these different domains of research? It revitalises questions about the organisation of trade, including mediums of exchange.

It is suggested that the the organisation of political economies and trade from the Middle Bronze Age onwards had reached a level of complexity comparable to later periods of the Iron Age and Viking Age.

This may also have included raids and trade in human labour.

9 PRODUCTION, CONTACTS AND EXCHANGES IN BRONZE AGE TRANSYLVANIA

Author(s): Wittenberger, Mihai (National History Museum of Transylvania)

Presentation Format: Oral

This work tries to explain the economical system from Transylvania during Bronze Age, in the context of the European society of that time. Considering the Carpathian Space as a living organism, I think that we can draw a viable model of a non-monetary economy.

For this purpose, I took into account: the geographical position, the human and natural resources, the production of goods, the internal and external contacts, the commerce. Transylvania's resources - huge then, relatively to the number of inhabitants -, were, above all: gold, copper, tin and salt. The metals production and the salt were, probably, strictly controlled by the chiefs of tribes or unions of tribes. Control was exercised in three ways: administrative, military and religious.

Inter-tribal connections were determined by economical factors, too. Some tribes were based on agriculture and cattle raising, while others on mining, metallurgy and salt exploitation. Between them must have existed a permanent exchange system (proximity exchange). Besides that, Transcarpathian commercial exchange (commerce at average distance) and commerce at very long distance took place. This especially because Transylvania was traversed by one of the commercial routes binding Aegean Sea to North Europe.

Average and long-distance exchanges corresponded to large quantities of goods, therefore of a very high value. It is the reason why the merchants were accompanied by armed men. The presence of weapons along the connecting paths is a proof in this sense. Except military and merchants, caravans were joined by craftsmen (artisans) who were creating, probably, custom-made artifacts, in bronze or gold. This is one of the models of spreading of some types of artifacts, and of reinforcing the European bonds.

10 ECONOMY AND STATE FORMATION PROCESSES IN BRONZE AGE CHINA: LATE SHANG DYNASTY (1250-1046 BC)

Author(s): Pokutta, Dalia (Stockholm University, Dept. of Archaeology, Archaeological Research Laboratory)

Presentation Format: Oral

The late Shang period has long been a center of attention in the study of early Chinese civilization. The volume of archaeological remains discovered from many regions shows a fully developed political setting of Bronze Age China, attested by the presence of large cities, such as at Anyang, pronounced social stratification, high levels of craft specialization, a writing system, and con-

stant warfare.

Cowrie shells were the first proto-money to be used in Chinese commerce. Archaeological evidence from the tombs has revealed their wide use as early as the 16th century BC. These items, due to their small size and portability, proved more popular than animal hides, jade, and silk, bartered. The shells used in trade eventually evolved into metal replicas. The evolution of copper non-monetary means of payment in China can be seen in a three-fold way. Firstly, according to tradition, the idea of 'money' was invented by the state, ancient sages and philosophers. Secondly, according to the theory of exchange convenience, the cowrie-money was chosen collaboratively as a solution to problems that occurred in a barter exchange. Thirdly, some scholars believe that early money came into existence for the sake of preserving, measuring and exchanging wealth. If two tradesmen from distant parts of China met during the Shang dynasty, they probably would not be able to communicate. However, they could trade, using the same type of money.

It is still highly debatable where, when, and how "the first China" emerged. But archaeological record from the Bronze Age shows clearly that the use of unified means of payment considerably speeded up overall state formation processes.

11 REMNANTS OF THE PAST, FRAGMENTS OF THE PRESENT: MEANS OF PAYMENT AND WAYS OF COUNTING WEALTH IN THE HOMERIC AGE

Author(s): Kuleshov, Viacheslav (Stockholm University)

Presentation Format: Oral

The Homeric Age was the last stage of a four-century-long transitional period from Mycenaean to Archaic Greece. The questions are of importance about the nature of multilineal economic transformation which took place after the collapse of Late Bronze-Age Mycenaean civilization and accompanied its social devolution. Developments of the pre-Homeric and Homeric Ages are only evidenced by Homer's epic poems and, to a much lesser degree, by archaeological data. What types of pre-coinage monetary systems, means of payment, and ways of counting wealth can be traced back to the period? According to the textual examination of the Iliad, the set of monetary units and means of payments reflected by the epics is of a mixed and panchronic nature. Most contexts mentioning gold, silver, bronze, precious fabrics, and slaves as valuables, indicators of wealth and status, units of gift-giving and exchange, belong solely to the sphere of epic action. The respective valuables must thus be regarded as 'remnants of the past' within the mental reconstruction invented by Homer himself using the epic formulas inherited from the Mycenaean and post-Mycenaean poetry. In contrary, less numerous contexts of the text dealing with cattle, skins and other low-rank commodities as means of counting and everyday exchange, have evidently no connection to the epic past, and must thus be assumed as default units, or 'fragments of the present', characteristic of the time of Homer. The drawn picture is in general agreement with an overall decline in wealth as reflected by archaeological material from pre-Archaic Greece.

12 DECONSTRUCTING THE MEANING OF GOLD AND LAPIS LAZULI IN ROYAL ECONOMIES AND IDEOLOGIES OF SUMERIAN CITY-STATES

Author(s): Sazonov, Vladimir (University of Tartu)

Presentation Format: Oral

Lapis lazuli and gold as symbols of luxury and high status has played a significant role in the economy, royal ideology and religion (e.g., burial practices, cults) of Sumerian and Akkadian kings since as early as the Early Dynastic Period, and later throughout the whole of Mesopotamian history. Lapis lazuli and gold were also seen as very important and even key factors in the Sumero-Akkadian religion and state ideology because of their meaning. Solar and celestial (heavenly) aspects of gold and lapis lazuli were strongly represented in Sumerian and Akkadian understandings of the world, divinity and kingship (also divine kingship). Silver has been regarded as regular "currency" in everyday life among ancient Mesopotamians since very early times, but gold and lapis lazuli possess another higher and much more sacred status; they were seen as elements of "royal treasury" or as the "treasury of the gods". Sources for this analysis are archaeological materials, artefacts from the royal cemetery of Ur (e.g., the tomb of Queen Puabi - Ur I period), other archaeological sites of Sumer and Akkad, and various written cuneiform sources, e.g., royal inscriptions, votive texts, various literary texts with mythological and religious content like the praise songs of Šulgi (Šulgi C, Šulgi D, Šulgi E), etc. In this paper the research subject will be examined in inter- and transdisciplinary ways. I used the following analytical methods: philological method, textual criticism, historical critical analysis. It should be noted that Ancient Near Eastern studies is quite a complex discipline, encompassing historical and philological approaches and the analysis of cultural, religious, folkloric and archaeological material. For analysis in this paper I mostly focused on textual evidence regarding lapis lazuli and gold in the Sumerian and Akkadian languages, and also relevant archaeological materials found in Sumer and Akkad in the 3rd millennium BC.

13 THE ECONOMY OF EUROPEAN IRON AGE FARMING COMMUNITIES ACCORDING TO TACITUS

Author(s): Gralak, Tomasz (University of Wrocław)

Presentation Format: Oral

The work of Tacitus (Germania) contains a broad range of information regarding social and economic relationships within the 'barbarian' communities beyond Roman limes. Confrontation with archaeological data allows us today to recognize commodities with an ascribed value that have been used in certain types of transactions. Firstly, it is a weapon and other iron items, agricultural products and raw materials, but it is possible also to recognize other non-monetary equivalents of exchange used by Iron Age communities. In Germanic funeral rites, Tacitus describes the inheritance and circulation of commodities (including,

for example, potlach). Some information given by him indicate the economic and social functions of gift and marriage exchange, allowing us to understand the concept of possession and ownership at the time. Roman coinage and commerce appeared as a factor changing and even destroying the economy of barbarian tribes. It can be certainly seen as a tool of economic pressure and political expansion.

14 THE ECONOMICS OF CHAOS OR THE CHAOS OF ECONOMICS: CENTRAL EUROPE IN THE MIGRATION PERIOD

Author(s): Gralak, Tomasz (University of Wrocław) - Pokutta, Dalia (Department of Archaeology, Archaeological Research Laboratory, Stockholm University)

Presentation Format: Oral

Main social and economic developments of the Late Roman period provide the clue to the decline of the Roman Empire and to the transition between the ancient world and the Middle Ages. This interregional transition, starting with the Migration period can be best understood in terms of the replacement, of an "ancient" by a "medieval" style of society. The economics of the Late Rome brought about consistent rise of incomes per capita for the general populace in the period. Another important element was that incomes in the newer provinces, particularly Trans-Alpine Europe, and the barbarian areas beyond the limes probably increased relatively more than those in the older center of the Empire. The first trend, a general rise in per capita incomes, undercuts a majority of previous explanations of Rome's fall. The second characteristic, changes in relative incomes among regions provide a positive implication as to the expected adaptation of the Roman state.

In this study we focus on living conditions, agriculture and economy of non-Roman populations inhabiting Central Europe, especially Silesia, SW Poland during the Migration Period (phase D1, ca. 360/370-400/410 AD, to phase D3, CA. 450-490 AD). The populations inhabiting Silesia in the IV-V century AD probably constituted a multi-ethnic conglomerate. The archaeological record of this period is highly incomplete for many reasons. Newly discovered cemetery in Tyniec upon Śląza offers a unique opportunity to study dietary practice, mobility, living conditions, economy and cultural hybridization among barbarian world outside of Roman limes. The site seems to be associated with the so-called post-Chernyakhov horizon, i.e. the waves of refugees from the Huns.

15 VIKING-AGE ECONOMIES IN TRANSITION: SILVER, COMMODITY MONEY, LONG-DISTANCE EXCHANGE, AND EMERGING MARKETS BETWEEN IRELAND AND THE URALS

Author(s): Kuleshov, Viacheslav (Stockholm University)

Presentation Format: Oral

The Viking Age was the last stage of North-European prehistory, and a three-century-long transitional period from the post-Roman Iron Age to the Middle Ages in Scandinavia and beyond. It started with the first Viking raids in Western Europe before AD 800, and ended in many parts of the larger Viking world between AD 1050 and 1150. The main cultural innovations and most peculiar features of social change of the period are urbanization, large-scale commodity production and exchange, long-distance trade, silver economies, and a rapid growth in market relations and the scale of individual wealth. Accompanied by impressive development of maritime traffic, and territorial expansion (colonization) of the world beyond their homelands, the Viking-Age communities underwent a significant transition from gift-giving and redistribution economies, typical of the previous periods, towards the many patterns of active economic behaviour including raiding, trading, hoarding, accumulating wealth in the form of silver, and producing commodities for local and international exchange. The paper also examines the chronologies of the processes in question based on numismatic and written evidence.

A. TERRACOTTA DISCS: A THOUGHT OF NON-METALLIC COINS

Author(s): Srivastav, Om (Center of Advanced Study, Department of History, A.M.U., Aligarh)

Presentation Format: Poster

The terracotta discs generally found from the Painted Grey Ware and Northern Black Polished Ware levels have not received the attention they deserve. The excavations in western Uttar Pradesh have yielded terracotta discs in abundance. It covers the periods from 1500 BC to 600 BC. Discs are casually described as minor objects like amulets, beads, bangles, toys, tools and other small objects of daily use. It is generally flat and circular in shape and made of well-fired clay. Discs are designed intentionally for the particular use and are exclusively decorated by making incised designs on both the surfaces. The ridges are also executed on the edges along the periphery of the disc. However, plain disc have also been found from the excavations. The theme of poster is comparative study of its motifs, symbols with punch marked coins and other traditional use, if any, within a cultural period and its transition from one culture to another. The punch marked coins consist of a rich repertoire of symbols. The symbols which are found on terracotta disc are very much identical with the symbols on punch marked coins. Perhaps the thought of symbols on punch marked coins must have been derived from terracotta disc. The theme of considering terracotta disc as the non-metallic coin is the similarity of the symbols in both objects. The common symbols are: Human figurines, Sun, Moon, Mountain, Swastika, Wheel, Star, Taurine, Tree, Arrow, Fish, Eye or Leaf design, Circle, Rectangle and other geometrical pattern etc. Apart from the astronomical signs some graffiti marks and unidentified symbols are also seen on terracotta disc.

A UNITED EUROPE OF THINGS: WAS THERE A COMMON HORIZON OF MATERIAL CULTURE IN THE LATE MEDIEVAL EUROPE?

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Sawicki, Jakub (Institute of Archaeology, Czech Academy of Sciences in Prague) - Lewis, Michael (Portable Antiquity Scheme; British Museum)

Format: Regular session

The idea of 'unity of culture' of Medieval Latin Europe is well known in historical literature, especially when it concerns the so called 'Europe North of Alps'. Scholars had often inclined that due to long distance trade, universal knowledge of Latin and shared religious ideas we can observe cultural similarities all over Late Medieval Europe. This bold statement (of course) is only partially true. Our question is whether a similar trend is visible in portable material culture? Archaeologists are dealing with this problem since interest in Late Medieval archaeology began, however not much interregional study has been done so far with a few exceptions, such as pottery studies and some conferences focusing on more local, or specific regions (i.e. Lubeck Hanseatic Colloquiums or Forum Urbs Medii Aevii). Recently though, the sessions concerning small finds, which were organized on previous meetings of the EAA Conference, have shown that there are many similarities in material culture between regions. To pick up this trend, we would like to provide a forum for more interregional discussion.

We would accept papers concerning late medieval (1200-1550) material culture (small finds, but not only) focusing on:

- finds that are typical and/or rare in regions as well as their comparison with other regions – at this state of research and lack of global communication over this topic, even basic ideas are worth to bring to the table!
- possible borders and peripheries of common material culture
- interactions between local material culture and imported things
- production, consumption and interregional trade
- moments of change – new material culture (or technologies) taking over older ones
- theoretical studies about interpreting material culture and ideas of 'common material' culture

ABSTRACTS

1 USING PORTABLE ANTIQUITIES DATA FOR RESEARCH: HISTORIES, POSSIBILITIES AND CHALLENGES

Author(s): Oksanen, Eljas (University College London)

Presentation Format: Oral

National portable antiquities schemes that record small archaeological finds made by members of the public have the potential to offer a vast novel source of evidence on past human activity and to enable valuable comparisons between material cultures in different regions and countries. Like all historical databases, however, the ones created by these schemes can themselves be considered as artefacts the character of which is determined by the needs, circumstances and decisions of the people and institutions who design and maintain them, and the individuals who contribute to their contents.

With particular reference to the medieval finds recorded by the pioneering Portable Antiquities Scheme (PAS) in England and Wales, this paper proposes to examine some of the challenges that arise in using small finds data in the context of the biases and features of a single database and consider how they might carry on into further cross-database work. What research or policy-driven historical design decisions contribute to a database's current form? How do its various features enable particular types of academic research, or other types of interaction with the data? How does the manner and the processes by which finds are recovered and recorded influence its contents, the interpretation of individual finds records within their historical and physical landscape context, in relation to other records within the database, and in relation to other historical and archaeological datasets?

These points will be discussed using recent research on the medieval PAS finds data. A limited comparison of the overall content breakdowns between some of the European portable antiquities databases will be made to illustrate dataset differences and similarities. The aim is to consider perspectives that would be relevant to the range of established or emerging portable antiquities schemes in Europe.

2 UNDERSTANDING VARIABILITY IN RURAL CONSUMPTION IN LATER MEDIEVAL ENGLAND

Author(s): Jervis, Ben (Cardiff University, School of History, Archaeology and Religion)

Presentation Format: Oral

This paper will draw on the large archaeological and historical dataset gathered during the 'Living Standards and Material Culture in English Rural Households, 1300-1600' project to explore how unified patterns of consumption were in later medieval England. This project combines information on the possessions of medieval felons (drawn from the records of the escheator and coroner), artefacts recovered from archaeological excavations and those reported to the Portable Antiquities Scheme. The paper will focus on key object types, including tableware and furnishings, to explore the extent to which consumption patterns and preferences vary regionally, through time and across society. By exploring the relationship between these variables a model for medieval consumption will be put forwards, in order to explain how and why some elements of consumption appear unified,

whilst others vary. This multi-scalar approach, drawing on 'big-data' and contextual case studies should provide opportunities to consider the ways in which material homogeneity in medieval Europe might vary in accordance with factors such as wealth, status, agricultural regime and profession.

3 BRISTOL AND COPENHAGEN: TWO URBAN PORT SOCIETIES, TWO TRADING REGIONS, ONE LATE MEDIEVAL CULTURE?

Author(s): Whatley, Stuart (University of Bristol; University of Cardiff)

Presentation Format: Oral

Thomas Hore was Sheriff of Bristol, and a local Bailiff. He was descended from MPs and merchants who were involved with the international cloth trade from Bristol. In his will of 1466 he left to his family and friends: land, property, an oak and iron chest, gold, silver and gilded tableware and a blood red coat trimmed with badger fur. In addition, his household material and tableware was bequeathed to others within his family, friends and former staff. Such artefacts have been recovered from excavations of Late Medieval commerce centres, with substantial collections found in Bristol and Copenhagen, cities that are part of my PhD research.

Bristol and Copenhagen in the Late Medieval period were similar type cities. They were both probably founded in the 10th century, developing from small ports into merchant cities in the 1200s. By the 1400s they were important trading hubs in their regions: Bristol in the Atlantic and Copenhagen in northern Europe.

In this talk I will examine the material culture of the societies living in Bristol and Copenhagen in the Late Medieval period. I will discuss how these cities obtained a similar material culture even though they were part of different trading networks. I will examine how and why material culture changed and how consumption and globalisation may have affected the material culture of their societies. Lastly, I will discuss how material culture had an effect on their surrounding environments and the cities themselves.

4 IT DEPENDS: THE USE OF HARNESS PENDANTS IN MEDIEVAL EUROPE

Author(s): Webley, Robert (University of York)

Presentation Format: Oral

The study of medieval harness pendants at the European level has benefited greatly from the work of Norbert Goßler and Stefan Krabath, who collectively demonstrated their use across a large area of Europe, from England and France in the west to Poland, the Czech Republic and Hungary in the East. Within this broad tendency for embellishing horse's harnesses with such pendants, which were visually striking, along with the soundscape of the bells that often accompanied them, these authors drew out certain particularities in the use of different forms in different parts of the continent.

This paper aims to build on the work of these two authors mainly in terms of chronology and social analysis. A diachronic approach will be taken to assess an apparent change (based on the presenter's doctoral work) from a commonality of forms at the start of the medieval period, to an increasing separation within Europe over the 13th and 14th centuries; here the evidence of pendant suspension mounts can also be brought in. Object construction and context of loss can be examined to assess the social significance of harness pendants both across space and through time, specifically whether their status decreased over the period considered. Finally, brief consideration will be given to whether the distributions of harness pendants support Krabath's tentative proposal of the division of Europe into seven 'large trading zones' in the Middle Ages.

5 ARCHAEOLOGY OF MEDIEVAL FASHION? SIMILARITIES AND DIFFERENCES IN DRESS ACCESSORIES IN EUROPE NORTH OF ALPS

Author(s): Sawicki, Jakub (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Oral

In 1483 Nicolaus von Popplau, a German knight in the (secret) service of his majesty Emperor Frederic III Habsburg started a journey that lasted three years. He had visited Germany, Netherlands, France and Iberian Peninsula. From those travels remained his reports, in which he describes other nations and their customs, pointing out everything that seems different to him, showing at the same time his own feelings, complexes and aspirations. In his writings there is not much about differences in people outfits until he visits territories of modern Spain and Portugal. Did it mean that in Western and Central Europe there were no differences which could have been seen by a traveling knight?

There are many publications about history of medieval fashion describing regional differences on the basis of iconography and written sources. Archaeology didn't contribute much to this subject, mostly due to fact that not many archaeological finds can be considered as 'fashion' in the way how this concept is usually used. However, dress accessories (buttons, belts, brooches etc.). In this paper I will show differences and similarities in dress accessories in medieval western and central Europe (ca. 1200-1500) from the perspective of those items themselves but also I will focus on their distribution, production and social context.

LATE MEDIEVAL KNIVES WITH ENGRAVED IMAGES: THEIR DISTRIBUTION AREAS AND SYMBOLIC REFERENCES

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

Presentation Format: Oral

The variety of knives from the Late Medieval period is large. The ones with copper alloy plates on their handles which are decorated with engravings of plants, animals and humans form a category of their own. More and more knives from the Netherlands of this category are recorded in the Portable Antiquities Scheme of the Netherlands (PAN: a web based system in which metal detected finds are recorded to be made available both for the larger public and academics). These numbers required the establishment of a typology, which is not only based on the variety of engravings on knives found by the Dutch metal detectorists, but also on knives known from other sources (city excavations, paintings, museum collections). This typology makes it possible to create distribution patterns in the Netherlands, and to compare them with knives known from regions outside the current Dutch borders. Are the knives with engravings typical for the Netherlands or not, and/or are the engravings themselves typical for the Netherlands of the later Medieval period or not? Moreover, the iconography and symbolic references of the identified typological groups of engravings will also be discussed, which should make it possible to attach meanings to the discovered distribution patterns of regional and/or supra-regional scales.

DISABILITY AND CARE IN MEDIEVAL TIMES: A BIOARCHAEOLOGICAL PERSPECTIVE INTO HEALTH-RELATED PRACTICES

Theme: Archaeological theory and methods beyond paradigms

Organisers: Micarelli, Ileana - Tafuri, Mary Anne (Sapienza Università di Roma) - Tilley, Lorna (Australian National University, Canberra)

Format: Regular session

During mediaeval times a large proportion of the population of Europe lived with chronic disease and disability. This resulted from a combination of variables: the impacts of deepening social and economic inequality; widespread political instability, often with associated violence at local, regional and state levels; increasing population density leading to declining public health; and, perhaps the largest single factor, the advent of frequent and deadly pandemics - starting with the so-called 'plague of Justinian', which spread throughout the Roman Empire between the V and VII centuries AD and was responsible for millions of deaths. This session aims to stimulate debate on perceptions of health and disease and on related practices of healthcare provision within European medieval society. It seeks to bring together people from various areas of archaeology and anthropology to explore ways in which evidence from material culture and human remains (considered either within discrete disciplinary parameters or within an integrated bioarchaeological framework), possibly in conjunction with contemporary documentary evidence, can clarify both the figure of the diseased individual and the community understanding of, and responses to, health and disease in the past. The post-classic, mediaeval era is particularly apposite for examination, as this period saw the formation of various important schools of medicine which helped to shape medical philosophies and medical treatment in Europe. We call for papers (and in particular case studies) on the bioarchaeology of care, with a focus on medieval times, but will consider case studies from other chronological horizons. Theoretical presentations aimed at encouraging constructive and creative discussion among researchers working on questions of past disability and care are also welcome.

ABSTRACTS

1 INTRODUCTION TO THE SESSION "DISABILITY AND CARE IN MEDIEVAL TIMES: A BIOARCHAEOLOGICAL PERSPECTIVE INTO HEALTH-RELATED PRACTICES"

Author(s): Micarelli, Ileana (Sapienza Università di Roma, Dipartimento di Scienze dell'Antichità; Sapienza Università di Roma, Dipartimento di Biologia Ambientale) - Tafuri, Maryanne (Sapienza Università di Roma, Dipartimento di Biologia Ambientale) - Tilley, Lorna (School of Archaeology and Anthropology, Australian National University)

Presentation Format: Oral

In the past, illness, in all its diversity, occupied a major part of persons' daily life. To deal with diseases, injuries, pain, deformities and bad life conditions, caused by environmental and/or social status, placed significant demands on individuals, their families and their communities. Moreover, it had a range of repercussions for religious beliefs and practice. Contemporary material culture and documents containing information on medicinal, surgical and spiritual treatments for pathologies reveal that in the past (as in the present) the restoration and maintenance of health - or, more simply, 'how the sick was cared for' - was a priority for the people of this time. This introductory talk opens a dedicated session which offers an archaeological focus on questions of 'disability and care' in Medieval times. It offers a brief overview of Medieval health and disease, culture and chronology as a basic framework in which to locate the papers that follow. This session has the aim to explain the logic, to drive the order in which the papers are presented, and to provide a focus group among researchers from several disciplines. The final goal is to discuss both why we (the organisers) believe this session to be important, and the ways in which it might contribute to a better understanding of everyday, hitherto undocumented, life in this period.

2 APPLYING THE BIOARCHAEOLOGY OF CARE APPROACH TO CASES FROM THE HISTORIC PAST: IMPLICATIONS FOR THEORY AND PRACTICE, AIMS AND ASPIRATIONS

Author(s): Tilley, Lorna (Australian National University)

Presentation Format: Oral

Caring for those disabled by disease or injury is a behaviour observed across all times and cultures, and is a defining characteristic of humanity. Because the type of care provided in any given circumstance potentially embodies a wealth of information about those giving care, those receiving care, and the wider community context in which care occurs, 'health-related caregiving' is now recognised as a rewarding focus for archaeology. The bioarchaeology of care offers a systematic approach for identifying and interpreting experience of disability and care in the past, with the goal of gaining deeper understanding of the lives and lifeways of those affected. Triggered by indicators in human remains suggesting survival despite functionally-limiting pathology, the methodology comprises four stages of analysis: Stage 1 describes the subject, diagnosis and lifeways; Stage 2 assesses clinical and functional disability impacts and determines likelihood of care; Stage 3 models the care likely provided; and Stage 4 examines the implications of this care for insights into the subject and their social environment.

Although most bioarchaeology of care studies undertaken to date involve subjects from prehistory, a few exceptions demonstrate that the methodology can be used successfully with individuals from later periods. However, applying the bioarchaeology of care approach to historic cases - managing the challenges as well as the opportunities encountered in negotiating relationships between text-based and material culture evidence - raises both conceptual issues and practical concerns which are yet to be explicitly considered. This presentation begins the process. After briefly outlining the bioarchaeology of care approach, it discusses how bioarchaeology of care analysis, in combination (or conflict) with documentary evidence, might help enrich our views of life in Medieval times, and what changes to current bioarchaeology of care research practices and procedures may be necessary to achieve this aim.

3 THE UNWRITTEN HISTORY OF MEDICAL TREATMENT: EVIDENCE FOR RITUAL-HEALERS AND THEIR ACTIVITIES IN THE PRE-LITERATE PAST

Author(s): Knusel, Christopher (UMR 5199, Université de Bordeaux)

Presentation Format: Oral

The capacity to act as a "healer" forms part of the social identity of a diverse range of uniquely specialized individuals cross-culturally who also perform a variety of other roles associated with transcendent ideologies, beliefs, and religion. They are ambivalent, capable of doing both good and ill. They defend the health and well-being of the individual and the community but, using the same knowledge, are also implicated in attacks on individuals and groups within and outside their communities. The ambivalence and the diversity of medico-religious healers in the recent ethnographic past and historically have made the identification of such individuals in the anthropo-archaeological record controversial. The argument presented here is that not only are such individuals identifiable in the archaeo-anthropological record, but that their practices disproportionately influence that record, acting as a powerful complement to historical sources for the development of medicine and medical knowledge. The evidence consists of the elaborate burials of such individuals as well as repeated funerary treatments of the dead.

4 THE GREATEST HEALTH PROBLEM OF THE MIDDLE AGES?

Author(s): Inskip, Sarah - Robb, John - Mitchell, Piers - Dittmar, Jenna (University of Cambridge)

Presentation Format: Oral

What was the greatest health problem of the Middle Ages? The Black Death of 1347-50, which killed 30-50% of Europe's population, must be a strong contender, but how does it compare with other, less dramatic causes of death and suffering? This paper compares the patterns and level of affliction caused by a spectrum of ailments, ranging from plague through tuberculosis, leprosy, childbirth, dental disease, malaria, back pain, diseases of infancy, and social conditions such as warfare, poverty, religious prejudice, and spiritual despair. Using pre-modern demographic models and the World Health Organization's calculation methods, we assess the impact of each health problem. If you were a medieval government aiming to improve your subjects' health, which would you target? Then, since it is too late to offer public health advice to Edward III, we use the results to reflect upon the different patterns through which health affects historical processes and the potential pathways of human-disease co-evolution.

5 BIOARCHAEOLOGICAL AND MULTI-ISOTOPIC INVESTIGATIONS ON MEDIEVAL HUMAN SKELETONS FROM THE MONASTIC GRAVEYARD AT BADIA POZZEVERI (ITALY)

Author(s): Amaro, Alessio (Department of Civilizations and Form of Knowledge, University of Pisa) - Fuller, Benjamin (Department of Archaeology and Heritage Studies, Aarhus University) - Fornaciari, Antonio - Giuffra, Valentina (Department of Translational Research and New Technologies, University of Pisa) - Mannino, Marcello (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

The number of bioarchaeologically-informed isotope reconstructions of diet in Medieval Italy are still few and even fewer studies have focussed on people buried in monastic cemeteries. The goal of our project is to start filling this gap in research by undertaking carbon, nitrogen, sulphur and strontium isotope analyses on bone and teeth collagen of individuals inhumated within the monastic complex of Badia Pozzeveri, near Altopascio (Lucca). This abbey lay on the Via Francigena, the route taking pilgrims

from France to Rome.

Badia Pozzeveri belonged to the Camaldolese branch of the Benedictine order and was active from the late 11th century until the late 14th century. This institution controlled numerous economic activities within its territory, including cereal cultivation, milling, cattle herding and the exploitation of aquatic resources from Lago di Sesto. Historical sources indicate that the diet of the monks included wheat, millet, eggs, beans, chestnuts, beef and fish (i.e. eels), as well as olive oil and wine.

In order to achieve our research objectives, we have sampled 49 individuals, whose biological profile has been established through detailed bioarchaeological examination. The specimens originate from different types of burials attributable to local people of different social levels. The population from Badia Pozzeveri did not suffer from serious diseases attestable osteologically and was healthy. Periostitis, caries and fractures have been detected in both males and females. Four healed wounds, inflicted on a cranium with a sword, could attest the presence of surgeons able to deal with such lesions and enabling longer life expectancy. Our study aims not only to reconstruct the diet of inhumated individuals from the abbey, but also to evaluate their social status by combining archaeological, anthropological and isotopic sources of evidence.

6 NURSING FELLOW CREATURES (FROM THE LIFE OF THE MEDIEVAL PEASANTS OF THE VICINITIES OF SUZDAL, RUSSIA)

Author(s): Fedorina, Anastasia - Dobrovolskaya, Maria (IA RAS) - Krasnikova, Anna - Shpolaynskiy, Sergey (State Historical Museum, Moscow) - Guseva, Violetta (State Social-Humanitarian University Russia, Kolomna) - Korshikova, Elizabeth (I.M. Sechenov First Moscow State Medical University)

Presentation Format: Oral

There are few contemporary sources of information about medical and supportive care practices in medieval Russia. This is especially true in relation to sources which go beyond individual cases of care (such as monastery records) and provide information on wider traditions of caregiving or details of medical knowledge. Archaeological evidence that provides clues to healthcare practices in medieval populations is therefore particularly valuable.

This presentation contains the results of analysis of material from the archeological rural complex Mikhali 3 near Suzdal, one of the principedom centers of the medieval Rus. We have excavated the part of rural settlement and cemetery, both dating to the 14-15th centuries. Skeletal remains of 25 people were examined to reconstruct paleodemography and lifestyle of this society. The high percentage of children (42%) and prevalence of females in adult burials (about 80%) are typical of medieval rural populations. High frequencies of stress markers, traces of chronic inflammation processes, and a low level of sexual dimorphism suggest the group faced significant health challenges; nevertheless, a significant proportion of the adults were older than 40yrs. While the quantity of stress-related biomarkers suggests poverty and tough living conditions, this conclusion is contradicted by material culture finds from the settlement. The collection of items recovered shows a considerable percent of high status objects, including three 3 fragments of bronze mirrors (undoubtedly imported) and Orda silver coins. These finds come from a comparatively large area, so are unlikely to belong to a restricted social elite.

What do these paradoxes - survival to relative old age under stressful conditions, and widespread distribution of status items - suggest about local society? The bioarchaeological data are used to discuss this question. One possible interpretation is that there was a tradition of supportive care practice among the peasantry.

7 GENDER AND THE POOR: THE UNFURNISHED BURIALS OF EARLY ANGLO-SAXON WORTHY PARK

Author(s): Cave, Christine (Australian National University)

Presentation Format: Oral

In the Anglo-Saxon cemetery of Worthy Park, Kingsworthy, Hampshire, eight men and eight women were buried with no surviving grave goods. These poor Anglo-Saxons may have been slaves and/or native British people put to work by the newly-arrived Angles, Jutes or Saxons; an examination of their lives, through their graves and their remains can provide a glimpse of lesser lives in the past - lives often missing in archaeological analyses.

Worthy Park men buried without grave goods lived hard lives. Life was even more difficult for the individual buried in grave 38 who was born without his left forequarter – his shoulder and arm were both absent; compensatory changes in the skeleton for the missing limb accrued over the half century or so that he lived, were evident. This individual was given adequate care to ensure survival, but like other men buried without grave goods, his life was one of hard work, violence and possibly prejudice.

Women buried without grave goods also display signs hard work and lesser treatment, but not to the degree that men suffered. In addition, their lesser treatment differs from that received by their male counterparts: or example, their work was less physically challenging than that of their brothers, but their teeth were in better condition than any other cemetery cohort. They suffered less violence.

This presentation will explore the similarities and differences in the lives of those buried with goods and those buried without. We will consider possible reasons for these differences and ask whether gendered attitudes helped or hindered the people of early Anglo-Saxon Worthy Park.

- 8** **CONSIDERING CARE: FLEXION DEFORMITIES IN THE GAELIC MEDIEVAL POPULATION OF BALLYHANNA, CO. DONEGAL, IRELAND**
Author(s): Mckenzie, Catriona (University of Exeter) - Murphy, Eileen (Queen's University Belfast)
Presentation Format: Oral
- Two individuals from the Gaelic medieval population of Ballyhanna, Co. Donegal, Ireland had flexion deformities evident in their skeletal remains, resulting in obvious physical impairments and mobility issues. The Bioarchaeology of Care approach has been adopted to assess the likely care and treatment which may have been provided. In the first case study, a healed central acetabular fracture-dislocation was identified in the left hip joint of an adult male. This was a major injury and clinical data indicates that, even in modern populations, this type of injury is particularly difficult to treat. In the second case study, the flexion deformity resulted in osseous ankyloses of the left knee joint in a middle-aged male, this was likely caused by either septic or tuberculous arthritis. The discussion will focus on the immediate care that both of these individuals may have received, and the accommodations that may have been made later in life.
- 9** **HOW MUCH PAIN A MAN CAN TAKE? MULTIPLE PATHOLOGICAL CONDITIONS IN AN ADULT INDIVIDUAL FROM MEDIEVAL AVENCHES, SWITZERLAND**
Author(s): Bourbou, Chryssi (University of Fribourg; Hellenic Ministry of Culture) - Amoroso, Hugo (Aventicum Site et Musée romain d'Avenches)
Presentation Format: Oral
- Severe pathological conditions leading to disability and their perception by past societies are currently more frequently discussed in bioarchaeological studies, and especially in the context of the Bioarchaeology of Care. In this paper we present a suite of pathological lesions observed in an adult individual from the medieval cemetery of Sur-Fourches at Avenches, Switzerland (11th c. AD). The post-cranial skeleton presents multiple pathological changes in joints and bones, e.g. of the shoulder girdle, upper limbs, vertebral column, thorax, as well as os acromiale, suggestive of a painful life with considerable impaired movement. In modern clinical practice arthritis and traumatic incidents, like fractures, are considered major public health problems, carrying with them substantial disability and reduced quality of life. Although such pathological conditions are commonly observed in archaeological populations, few studies focus to their actual effects on the everyday life of past people. It is, thus, important to include such conditions in the overall discussion of disability in the past as they can also serve as potential indicators of life quality and social care in a society.
- 10** **SURVIVING A TRAUMATIC HEAD INJURY IN MEDIEVAL EUROPE: A CASE STUDY FROM TRANSYLVANIA**
Author(s): Bethard, Jonathan (University of South Florida) - Ainger, Timothy (University of Kentucky College of Medicine) - Gonciar, Andre (ArchaeoTek-Canada) - Nyaradi, Zsolt (Haaz Rezso Muzeum)
Presentation Format: Oral
- Bioarchaeologists routinely examine antemortem skeletal trauma in order to better understand accidental injuries and instances of interpersonal violence in the past. Few studies, however, have considered or interpreted how people managed long-term effects of traumatic injuries, particularly those that may have had disabling consequences. Moreover, only recently have scholars considered the neurological effects of traumatic head injuries and the necessity of post-injury caregiving required for survival. In the case study presented here, we describe a middle-aged or old adult male (Burial 195) who suffered a traumatic head injury prior to his death. The individual's skeletal remains were recovered from a Christian churchyard in the Székely region of Transylvania as part of a salvage excavation and radiocarbon dated between Cal 1450 AD and 1640 AD. The left parietal exhibits evidence of a healing penetrating injury, approximately 39 mm superior to the squamosal suture. This anatomical location places the injury above the "hat brim line" which is often utilized in forensic anthropology to make inferences about interpersonal violent contact. The defect measures approximately 25 mm anterior-posteriorly and 16 mm inferior-superiorly, with blunted, rounded edges that are indicative of a considerably well-healed injury. From the ovoid defect, a radiating fracture extends anteriorly 80 mm into the frontal, terminating superior to the left orbit. Beyond describing the osteological presentation of this injury, we consider injuries to surrounding brain tissue and the possible implications for post-injury functioning.
- 11** **SURVIVING AMPUTATIONS AND CAREGIVING IN MEDIEVAL TIMES: A CASE OF A YOUNG WOMAN'S FEMORAL AMPUTATION IN A RURAL COMMUNITY**
Author(s): Van Cant, Marit (Vrije Universiteit Brussel; The University of Sheffield)
Presentation Format: Oral
- Evidence of healed limb amputations in the medieval archaeological record is scarce since many of the afflicted did not survive the hazardous surgical intervention before the introduction of advanced medical techniques.
- The osteological analysis of a late-medieval young adult female that was unearthed from a rural parish churchyard in Moorsel (Flanders, Belgium), revealed a healed right thigh bone, or femoral amputation. Hence, this case study provides a unique opportunity to address questions about healthcare, medical treatment, survival strategies and motivations for the amputation.
- What were her possibilities of playing an active role in a medieval rural community, and how would this society have acted towards people with impairments? Prior to the introduction of anaesthetics, an amputation must have been a traumatic experience for a person. In the absence of documentary sources that could shed light on the psychological state of this disabled young

woman, or on the social-cultural behaviour of her community, this paper explores the osteological evidence as well as the funerary treatment alongside other rare similar cases of amputations in the (mainly) medieval archaeological dataset, and integrates the concept of the bioarchaeology of care to identify and to interpret caregiving in the past.

As demonstrated by other contemporary and clinical findings, this case study could help to reshape the current preconceptions of people with disabilities in the past.

12 DISABILITY IN A MEDIEVAL VILLAGE COMMUNITY: A UNIQUE CASE OF FACIAL DYSMORPHISM

Author(s): Miclon, Valentin - Bédécarrats, Samuel (UMR CITERES 7324 - LAT; Université de Tours) - Laure, Boris (CHRU de Tours - Service de chirurgie maxillo-faciale, Hôpital Trousseau) - Coqueugnot, Hélène (UMR 5199 PACEA; Université de Bordeaux; Ecole Pratique des Hautes Etudes - EPHE) - Herrscher, Estelle (UMR 7269 LAMPEA; Aix-Marseille Université) - Zadora-Rio, Elisabeth (UMR CITERES 7324 - LAT; Université de Tours)

Presentation Format: Oral

Archaeological excavations carried out in the 1990s in the former rural parish of Rigny (Indre-et-Loire, France) uncovered 1738 graves. Among the individuals discovered, a female adult presents a series of cranial deformities characteristic of an extremely rare pathology, till then unknown in the archaeological record: the Treacher-Collins syndrome. It induces facial dysmorphism and is generally associated with hearing loss or even conductive deafness of the patient due to malformations of the hearing system.

The retrospective diagnosis of this individual was based on macroscopic analysis and computed tomography (CTscan). The use of 3D imaging made it possible to explore the impact of the pathology on the individual's hearing.

In addition to the functional implications, the negative impacts of facial dysmorphic disorders in the social sphere are well known in today's societies while they are poorly documented for the medieval period.

During this period, diet was an important social marker. The analysis of the individual affected by this syndrome's diet, compared to those of other members of the Rigny village community, provides an opportunity to discuss the social significance of disability in a rural context in the Middle Ages. In this perspective, the isotopic ratios of carbon and nitrogen of this individual's bone collagen were compared to those of forty-seven other individuals found on the site.

Archaeological, paleopathological and biochemical information are relevant to better characterize the functional repercussions of this syndrome on the Rigny individual and also to discuss the integration of this individual into this medieval village community.

13 3D REAPPRAISAL OF TREPANATIONS AT ST COSME PRIORY BETWEEN THE 12TH AND THE 15TH CENTURIES, FRANCE

Author(s): Bédécarrats, Samuel - Miclon, Valentin (UMR CITERES 7324 - LAT; Université de Tours) - Travers, Nadine (CHRU Tours) - GAULTIER, Matthieu (SADIL; UMR CITERES 7324 - LAT) - Herrscher, Estelle (Aix-Marseille Université; UMR 7269 LAMPEA) - Coqueugnot, Hélène (UMR 5199 PACEA; Université de Bordeaux; Ecole Pratique des Hautes Etudes - EPHE)

Presentation Format: Oral

Bone surgery is the most explicit testimony of care observable on ancient human remains. From the 12th century onwards, surgery was taught in universities. The late Middle Ages is therefore a context allowing a direct comparison between bones and texts. However, archaeological examples are quite spare and constituted mainly of isolated cases. In this study, we present six cases of cranial interventions uncovered at St Cosme priory in the center of France (La Riche, Indre-et-Loire).

The palaeopathological study was complemented by the use of computed tomography (CTscan) and microtomodensitometry (μ CTscan). In order to discuss neurological health status, a protocol of reconstruction of virtual endocast was implemented. The 3D models obtained were analyzed morphologically, metrically and using tools from geometric morphometrics.

Along with the palaeopathological approach, a study of palaeodiet was conducted by analyzing carbon and nitrogen isotopes for a total of 55 individuals: although diet is regulated in monastic communities, exceptions to the rule exist for ill people. Thus research of specificities in diet for trepanned subjects brings new insights on medieval care.

Regarding the results, surgical procedures observable within the sample are consistent with the practice described in medieval surgical treatises. In those texts, trepanation is used for cleaning cranial traumas. Paleopathological analysis provides evidence of neurological disorders for five of the six cases studied suggesting that, in this population, trepanation was most often used to treat neuronal disorder. All those observations bring the discussion to the link between medical treatises and archaeological cases.

14 ORTHOPAEDIC HEALTHCARE PRACTICES IN LATE MEDIEVAL AND EARLY MODERN DUTCH INFIRMARIES

Author(s): van Spelde, Anne-Marijn (Stockholm University; University of Copenhagen) - Waters-Rist, Andrea (University of Western Ontario)

Presentation Format: Oral

Traditionally, healthcare in the Medieval period has been portrayed as crude, unhygienic, and administered by care providers with insufficient or inconsistent training. However, in the past few decades the field of disability studies has shed a different light on care, treatment and disability through interdisciplinary studies involving medical history, archaeology and bioarchaeology. Most bioarchaeological studies have consisted of case studies, assessing individuals through the framework of the bioarchaeology of

care. Here we present results from an osteological analysis of three infirmary cemeteries from the Netherlands dating between the 13th and the 17th centuries AD. Infirmarys were the first form of institutionalized healthcare in the Netherlands, providing treatment to people from low socioeconomic standing as a form of charity, first by the church and later by the city. This study moves away from the focus on case studies and examines the osteological remains in the context of the complete cemetery. The collections from Haarlem, Delft and Breda were analyzed for signs of care and treatment of fractures, dislocations, scoliosis, kyphosis and paralytic conditions through osteological, radiological and handheld x-ray fluorescence (hhXRF) analyses. In general, treatment was most frequently detected in the fracture cases. However, two cases involving kyphosis and a paralytic condition suggests treatment was not limited to fractures. In addition, the difference of distribution of orthopaedic conditions between the infirmarys suggests that the Breda infirmary might have a different emphasis on treatment and care than the Delft and Haarlem infirmary. Findings from these collections will help provide a better understanding of the nature, access and quality of care and treatment accessible to individuals from lower segments of Medieval Dutch society.

15 EXPLORING PHYSICAL IMPAIRMENT AND DISABILITY IN MEDIEVAL CAMBRIDGE USING A BIOMECHANICAL APPROACH

Author(s): Dittmar, Jenna (McDonald Institute for Archaeological Research, University of Cambridge) - Mulder, Bram - Mitchell, Piers (Department of Archaeology, University of Cambridge) - Inskip, Sarah (McDonald Institute for Archaeological Research, University of Cambridge) - Cessford, Craig (McDonald Institute for Archaeological Research, University of Cambridge; Cambridge Archaeological Unit, Department of Archaeology) - Stock, Jay (Department of Archaeology, University of Cambridge; Western University) - Robb, John (Department of Archaeology, University of Cambridge)

Presentation Format: Oral

This research explores physical impairment and disability in medieval society through the biomechanical analysis and contemporary contextualisation of skeletal trauma and musculoskeletal deformities. For this study, the human skeletal remains from the urban parish cemetery of All Saints by the Castle (n=79), an Augustinian friary (n=38) and the hospital of St. John the Evangelist (n=209) located in Cambridge, UK, were selected for analysis. The trabecular and cortical bone architecture of individuals with complete ante-mortem fractures or musculoskeletal deformities that affected the pelvis or long bones in the lower limb were analyzed using micro-computed tomography (CT) to infer physical impairment. The data collected from these individuals was then compared to individuals without these conditions. Analysis of the CT scans revealed bilateral asymmetry and alterations in the trabecular bone in the weight-bearing skeletal elements on the side of the bone that presented with a fracture or deformity. These differences were only observed in the trabecular architecture, and no differences were identified in the cortical bone. This suggests that the analysis of trabecular bone may provide a more sophisticated assessment of the functional aspects of physical impairment as trabecular bone appears to respond differently to altered loading conditions than cortical bone. When incorporated with social theories and contextualised, these findings enhance our ability to reconstruct physical impairment and lived experiences during the medieval period.

16 USING ISOTOPIC ANALYSIS TO INVESTIGATE DIET AND DISEASE IN A MEDIEVAL GERMAN POORHOUSE

Author(s): Olsen, Karyn (Department of Anthropology, The University of Western Ontario) - von Heyking, Kristin (AnthoArch GbR) - Grupe, Gisela (Department of Anthropology and Human Genomics, Ludwig-Maximilians-University of Munich) - White, Christine D. (Department of Anthropology, The University of Western Ontario) - Longstaffe, Fred J. (Department of Earth Sciences, The University of Western Ontario)

Presentation Format: Oral

Medieval poorhouses were an early form of social care facility that offered permanent shelter to the sick and destitute. This paper presents a bioarchaeological case study on a medieval (twelfth to sixteenth century) poorhouse skeletal collection from Regensburg, Germany. By assessing the health and diet of poorhouse members, we explore the lives of an underprivileged group within larger medieval society. The most common pathological conditions observed in the sample (n = 111) include dental disease, osteoarthritis, and non-specific evidence for stress (e.g., periosteal reactions). Together, the osteological evidence suggests that many of the individuals suffered significant health stressors, but the conditions were debilitating rather than deadly. In addition to examining health, we use isotopic data from bone collagen and structural carbonate to explore dietary histories among poorhouse residents. Carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope analyses indicate that poorhouse residents subsisted primarily on C3 plants and protein from terrestrial and freshwater sources. However, the results also suggest differential access to protein, and a small subset of individuals may have incorporated socially inferior famine foods (e.g., millet) into their diet. Despite a shared lower-class status at the end of their lives, these data suggest that the backgrounds of poorhouse residents may have been economically diverse. The bioarchaeological framework applied here allows us to comment on the lived experience of Regensburg's urban poor and the social response to poverty in this medieval city.

A. STRATEGY OF MEDICAL TREATMENT IN THE FIELD HOSPITAL CONDITIONS DURING NAPOLEONIC WARS: ANTHROPOLOGICAL EVIDENCES

Author(s): Shvedchikova, Tatiana (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Poster

Chronic war conflicts are usually accompanied by development of medical treatment techniques. Napoleonic wars during the

18-19th cent. gave birth not just to the new way of organization the field hospitals and appearance of ambulances, but also let to develop surgery. High energy wounds due to close artillery fire caused the damages sometimes absolutely incompatible with life. In the cases of severe injury of limbs the most common performed operation was the amputation. This technique is very profoundly described in medical literature, but few archaeological finds are known. The traces of operation could be found on the human remains originated from the collective burials dated by 1813 in Kaliningrad (former Koenigsberg). Several individuals show the signs of healing process after the operation. Also numerous amputations were found in sanitary collective burial discovered in 2016 near the Borodino battlefield. The pit contained scattered remains of more than 90 French and Russian Armies soldiers. 12 samples of amputated lower limbs showed no traces of healing. Microscopic and trace evidence analysis allow us to reconstruct the procedure stages and compare it with written sources. The place where the burial was found is located near Kolotsky Monastery. It is known that after Borodino battle in 1812 the hospital for wounded soldiers was organized there by Napoleon. A team of surgeons headed by D.J. Larrey worked there trying to save soldiers lives.

B. POST-MORTEM FETAL EXTRUSION: A CASE STUDY FROM THE CEMETERY AREA OF LEOPOLI-CENCELLE (VITERBO, ITALY)

Author(s): Baldoni, Marica (University of Rome Tor Vergata) - Stasolla, Francesca Romana (Sapienza University of Rome) - Martinez-Labarga, Cristina (University of Rome Tor Vergata)

Presentation Format: Poster

The vulnerability of young women, often over-represented in archaeological populations, is usually associated with pregnancy and childbirth. Despite this general assumption however, only several cases of pregnant woman have been documented in archaeological contexts¹⁻¹².

In many cases there is a lack of archaeological evidence of maternal and perinatal mortality which is clearly detectable only when the fetus is retained within the uterus of the mother.

These situations may verify as, suggested before, as a consequence of complications during parturition such as hemorrhage, prematurity⁴ and dystocia^{7-8; 10-12}. In some cases, however coffin births have been documented¹³⁻¹⁷.

How can it happen? The production of gases during the decomposition process causes a significant abdominal swelling which determine both the increase of intra-abdominal pressure and the relaxation of the soft tissues¹⁸. This can result in a pressure on the uterus causing the expulsion of the fetus¹⁹.

During 2017 excavation campaign in the cemetery area of Leopoli-Cencelle (Viterbo, Italy; 9th-15th centuries) a burial of a woman with a fetus between her legs was recovered. The fetus showed a lateral decubitus with the head downwards next to the knee of his/her mother.

In these cases, in which the fetus is recovered between the legs of a woman it would be worth considering that dead occurred during pregnancy and not as a consequence of labour complications. The taphonomic analysis, in fact, allow determining the woman was wrapped in a shroud that could have caused the existence of a sufficient wide space for the extrusion.

This case study represents an important occasion to investigate the maternal causes of death in past populations too often attributed to childbirth complications without considering other possibilities.

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ANIMALS ON THE MOVE: WHEN, HOW AND THE IMPLICATION FOR HUMANS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Pellegrini, Maura (Research Laboratory for Archaeology and the History of Art - University of Oxford; Department of Biology - University of Florence) - Valenzuela Lamas, Silvia (Consejo Superior de Investigaciones Cientificas- Institucio Milà i Fontanals - CSIC-IMF)

Format: Regular session

Animal mobility is crucial for human subsistence. From Paleolithic to present-day, animal movements have determined the nature and abundance of resources available to humans. In paleolithic and mesolithic times, ecology and physical/geographical boundaries were likely major factors affecting animal movement and provisioning. However, animal routes, rhythms and changes through time are barely known, and several observations suggest that humans may have influenced "natural" animal mobility. As time went on and human demographic density increased, socio-political structures became a major factor for mobility, because political boundaries and human decisions determined whether animals could cross a territory or not. This may or not have been associated with the mobility of goods.

This session aims to bring together Paleolithic to post-medieval times animal mobility researchers who are focusing on novel techniques. Methodological approaches include (but are not restricted to) isotopes, geometrics morphometrics, ancient DNA, and histological analysis. Integrative contributions, for example where ecology, paleoclimate, paleoenvironmental forces, hunter-gather relationships and material culture mobility are combined with chemical/physical measurements, are encouraged.

1 STABLE ISOTOPE RANGES IN MODERN DOMESTIC PIGS COMPARED WITH THEIR DIET AND ENVIRONMENTAL SURROUNDINGS

Author(s): Anders, Dominic - Vohberger-Herles, Marina - Osmanovic, Amira (Ludwig-Maximilians-Universität München)

Presentation Format: Oral

The analysis of stable isotopes in bioarchaeology was established as an important tool over the past decades. In general, stable isotope ratios serve as natural markers for different transport processes of matter through the geosphere, hydrosphere and biosphere.

In physical anthropology, stable isotope ratios can be used to detect possible migrations or trading of ancient populations or individuals, for the reconstruction of dietary habits, palaeobiodiversity and climatic conditions.

However there is a lack of experimental data to verify existing models to distinguish local from non-local individuals. Various species specific physiological and metabolic peculiarities are unknown. One such specific concern is the source partitioning of stable isotopic ratios into the different consumers' tissues such as bone, teeth, blood, and meat, as well as the natural variation of isotopic ratios within one species at one location.

The SPOCK-project (Source partitioning of stable isotopes in the body tissues of livestock) aims to fill this knowledge gap by analysing stable strontium and oxygen isotopes in domestic pigs which are commonly used for reconstructing migratory events.

Strontium results show that there is a relation between water source, food and body tissue but no influence by underlying soil. The effect of biopurification can be observed and there is evidence that even small proportions of non-local food components can noticeably alter the isotopic composition of body tissues.

First oxygen results indicate that the nursing effect might be much higher in pigs, than what is known for humans. Several linear regression and mass balance models are applied to the oxygen data, leading to more or less promising results.

This research project was funded by LMU Munich's Institutional Strategy LMUexcellent within the framework of the German Excellence Initiative.

2 $\delta^{13}\text{C}$ AND $\delta^{18}\text{O}$ VARIATION WITHIN INDIVIDUALS IN AFRICAN UNGULATE TOOTH ENAMEL

Author(s): Luyt, Julie - Sealy, Judith (University of Cape Town)

Presentation Format: Oral

Intra-individual variation of the isotopic composition of dental tissues can be used as a valuable source of information. The sequence of tooth formation from initial mineralisation, crown completion, root development and emergence is similar across all mammals, with 1st molars forming and erupting first and 3rd molars emerging last. This sequence can be used to construct a life history for each animal. Changes in isotopic value might reflect residential mobility or change in diet. A question important to archaeologists and palaeontologists is: are the isotopic composition of different teeth along the tooth-row of an individual animal consistent, so that measurements of different teeth are directly comparable?

This study analysed isotopic variations within individual animals to answer this question. We analysed teeth along the tooth row as well as variation within individual teeth. In the first phase, three to six teeth were sampled along the tooth row from each of 23 ungulate individuals and $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ measured on bulk enamel samples, averaging the period of crown formation. In the second phase serial samples were taken from M2s and M3s in two individuals of a single species.

The tooth-row results show that $\delta^{13}\text{C}$ values of different teeth from the same animal varied by 0.5-6.0‰. $\delta^{18}\text{O}$ values of different teeth from the same animal varied by 0.5-6.2‰. There were no consistent patterns along the tooth row for any species. The serial sampling showed variation of 3.7-4.4‰ in $\delta^{13}\text{C}$ and much higher variation in $\delta^{18}\text{O}$ of between 5.2-6.7‰. We conclude that the presence or absence of inter-tooth patterning in $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ depends in part on the life history of the animal being studied. The isotope profiles obtained from serial sampling in animals with tightly constrained birth seasons will depend in part on the seasonal availability of food and water.

3 CAMELS IN THE ROMAN EMPIRE. A NEW APPROACH TO THE ORIGIN OF CAMELS USING STABLE CARBON AND OXYGEN ISOTOPES

Author(s): Habinger, Sophie - Bocherens, Hervé (University of Tübingen) - Pigièrre, Fabienne (Royal Belgian Institute of Natural Sciences) - Dövenner, Franziska (Centre nationale de recherches archéologique) - De Cupere, Bea (Royal Belgian Institute of Natural Sciences)

Presentation Format: Oral

Although camels are not indigenous to Europe they were found at several sites from Roman provinces starting with the beginning of the 1st century AD. Therefore it must have been beneficial to bring them there. Based on finds of remains of juvenile individuals (e.g. from Tanasi) it was also suggested that the Romans might have systematically bred camels within Europe.

For our study we took serial samples of the enamel of four camels from Central European sites (Innsbruck-Wilten, Mamer-Bertrange, Tongeren, and Trier) dating to the 2nd - 4th century AD. We measured the relative isotopic abundances of carbon and

oxygen isotopes of the carbonate fraction of the tooth enamel. The $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values reflect the climate and habitat in which an individual lived during the time of tooth mineralization. We used this data to pinpoint the places of origin of the camels and to estimate the age at which they were brought to Europe. It seems that all of them originate from different places outside of Europe. Furthermore our data can function as an additional proxy for species determination due to the different habitats of *Camelus bactrianus* and *Camelus dromedarius*.

4 REASSESSING CALIBRATION OF LA-MC-ICP-MS SR ISOTOPE ANALYSIS OF LOW STRONTIUM TOOTH ENAMEL

Author(s): Rogers, Bryony (Department of Archaeology, Durham University; NERC Isotope Geosciences Laboratory, British Geological Survey, Keyworth, Nottingham) - Pashley, Vanessa - Horstwood, Matt (NERC Isotope Geosciences Laboratory, British Geological Survey, Keyworth, Nottingham) - Nowell, Geoff (Department of Earth Sciences, Durham University) - Evans, Jane (NERC Isotope Geosciences Laboratory, British Geological Survey, Keyworth, Nottingham) - Montgomery, Janet (Department of Archaeology, Durham University)

Presentation Format: Oral

Variations in the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio in archaeological tooth enamel are regularly used to study past mobility. While removing enamel samples by micro-drilling and analysing the chemically prepared strontium using TIMS is both reliable and accurate, laser ablation-multi collector-inductively coupled plasma-mass spectrometry (LA-MC-ICP-MS) has been proposed, and used to a limited degree and success, as an alternative method for the rapid in-situ analysis of strontium isotopes. However, some studies report the presence of molecular interferences on all the Sr masses, with additional interference in bio-apatites of CaPO_4 or ArPO_4 on mass 87. This is particularly apparent in low strontium samples, such as enamel, and which cannot be chemically removed during LA-MC-ICP-MS. Without adequate elimination of, and/or correction for these molecular interferences strontium isotope ratios will be artificially high. Human and terrestrial animal tooth enamel typically have very low strontium concentrations (c.50-300ppm), which are considerably below the concentration required to swamp the effect of this interference (c.1900ppm and above). While tuning for low oxides and using a collision cell can limit the formation of certain molecular interferences, this rarely removes them entirely and calibration to a set of preferably matrix-matched reference materials may still be required. Here we present recent work using a calibration set of low [Sr] human tooth enamels previously characterised isotopically by TIMS and investigate whether geogenic apatites can be used, to accurately correct for remaining interferences on mass 87.

5 CREATING BIOAVAILABLE STRONTIUM ISOTOPE BASELINES

Author(s): Pellegrini, Maura (University of Oxford; University of Florence) - Copeland, Sandi (Los Alamos National Laboratory)

Presentation Format: Oral

The assessment of the strontium isotopic signature of a certain territory, and therefore the signature available to organisms growing and dwelling in that territory, is of fundamental importance for reconstructing animal mobility in the modern, archaeological and palaeontological contexts. It is a matter of interest, therefore, to establish a suitable, efficient and reliable way to perform this study. An estimate of the likely bioavailable strontium isotopes can be made from geological maps and literature, but rarely is this information adequate for determining the actual strontium isotopic bioavailable profile in the territory of interest. For this purpose, environmental samples of different kinds from the modern region are expressly collected and measured: rocks, soils, plants, local modern micro- or macro-mammals, snails, and insects are a few of the environmental samples collected and used for this purpose. This paper will review a series of different approaches existing in the literature with the aim of stimulating a discussion on the subject, heading towards the identification of the finest method to reconstruct bioavailable strontium profiles.

6 SAMPLING FOR ANIMAL MOBILITY AT A LARGE SCALE: METHODS, CHALLENGES AND POSSIBILITIES

Author(s): Nieto Espinet, Ariadna (CSIC- Institució Milà i Fontanals) - Trentacoste, Angela (University of Oxford) - Guimaraes, Silvia - Valenzuela Lamas, Silvia (CSIC- Institució Milà i Fontanals)

Presentation Format: Oral

The study of animal mobility in archaeology has experienced a huge development in the last few years following the generalisation of chemical analyses (e.g. ancient DNA and isotopic studies, namely on oxygen, strontium and sulphur isotopes). These techniques open new perspectives to analyse sourcing areas, mobility patterns and changes through time, but also present some challenges due to their financial costs and destructive nature.

The present contribution will provide a discussion of the sampling strategy developed in the frame of the ERC project 'ZooM-West- Zooarchaeology and Mobility in the Western Mediterranean: from the Late Bronze Age to Late Antiquity'. The project is focused on animal mobility, and both ancient DNA and strontium and oxygen isotopic studies are developed at a large chronological and spatial scale. Questions to be tackled will include the best strategies to detect translocation and regular trade, as well as to detect regular seasonal movements. The discussion will include some of the results obtained, which suggest different mobility patterns depending on the species and the time frame considered.

- 7 MOBILITY OF CATTLE AND OTHER LIVESTOCK IN THE IRON AGE AND ROMAN NETHERLANDS**
Author(s): Albarella, Umberto (University of Sheffield) - Groot, Maaïke (FU Berlin; University of Sheffield)
Presentation Format: Oral
- Material culture shows extensive trade networks in both the Iron Age and Roman period in the Netherlands. Movement of people has been documented historically and has been suggested based on the archaeological evidence. Until recently, little was known about the mobility of livestock in this region. The size increase in cattle in the Roman period has been partly attributed to interbreeding with imported, larger animals, but there is no proof for this. Strontium isotope analysis of cattle teeth from a rural settlement dating from the Middle Iron Age to the Middle Roman period and of cattle, sheep/goat and pig teeth from a Roman vicus provide new insight into the extent of mobility of livestock as well as into the possible origins of animals. These new data have been combined with zooarchaeological and archaeological data to achieve a more complete picture of animal husbandry and trade in the Iron Age and Roman period.
- 8 COASTAL CAMELID HERDING OF NORTHERN PERU: INSIGHTS FROM STRONTIUM AND LEAD ISOTOPES FROM HUACA COLORADA (AD650-AD850), JEQUETEPEQUE VALLEY**
Author(s): Alaiça, Aleksa (University of Toronto) - Gonzalez La Rosa, Luis Manuel (Lima, Peru) - Knudson, Kelly - Gordon, Gwyneth (Arizona State University)
Presentation Format: Oral
- Camelid herding served as an important economic and social practice in the Andes throughout its history. The desert coast presents an interesting and important context for these pastoral activities. The Moche site of Huaca Colorada, dating to AD650 to AD850, is an integral node in the Jequetepeque Valley of northern coastal Peru with evidence of long-term ties to highland Cajamarca communities. Recent isotopic studies undertaking radiogenic strontium (N=106) and lead (N=60) analyses attest to the diverse origins of camelid herds that could have included both llamas (*Lama sp.*) and alpacas (*Vicugna pacos*). This paper will discuss this large new dataset to contribute to the debate of camelid herds on the coast and the practice of local versus non-local animal husbandry and foddering strategies. We argue that camelids formed important offerings to large feasting events that brought local and non-local people together to reinforce existing bonds and create new social, economic and political relationships.
- 9 ISOTOPIC INVESTIGATION OF ANIMAL MOVEMENT PATTERNS IN LATE GLACIAL ITALY. THE IMPACT ON HUNTER-GATHERER SUBSISTENCE STRATEGIES**
Author(s): Pellegrini, Maura - Lee-Thorp, Julia (Research Laboratory for Archaeology and the History of Art, University of Oxford) - Le Roux, Petrus (Department of Geology, University of Cape Town) - Ucelli Gnesutta, Paola (Department of Archaeology, University of Pisa) - Donahue, Randolph (Department of Anthropology, Michigan State University)
Presentation Format: Oral
- Historical records show seasonal transhumance was practiced in central Italy in order to feed flocks with fresh pastures in summer and provide shelter in winter. Herds were moved from coastal lowlands to mountain highlands in spring and returned to the former in autumn. Archaeologists have proposed such movement for wild animals in the region during the Late Glacial and that hunter-gatherers followed these animals as a fruitful hunting strategy.
- We tested this hypothesis by determining sequential oxygen and strontium isotope ratios in third molars of archaeological equid and cervid species to explore the animals' seasonal ranging behaviour. M3's in both animals mineralise gradually enough to record one or more winter-summer shifts, oxygen isotopes provide a proxy for climate and environmental conditions, and strontium isotopes for the geological substrates covered during this period.
- Here we present the $\delta^{18}O$ and $87Sr/86Sr$ results from teeth selected from three stadial and interstadial layers of the Upper Palaeolithic archaeological sequence of Settecannelle (Lazio). Comparative modern samples were measured to investigate the bioavailable strontium background for this specific area. Intra-tooth sequences show strong $87Sr/86Sr$ attenuation compared to the variability observed in the environment, but there are consistent variations observed to indicate seasonal movements across the region. However, such movements seem opposite to what is hypothesised and to have changed little through time.
- 10 HORSE PROVISIONING AT IRON AGE CAN ROQUETA (SABADELL, BARCELONA). AN INSIGHT FROM STRONTIUM ISOTOPES**
Author(s): Valenzuela, Silvia (Consejo Superior de Investigaciones Científicas - IMF- ASD) - Albizuri, Silvia (Universitat de Barcelona, Departament d'Història i Arqueologia- SERP) - Bosch, Delphine (Géosciences Montpellier, UMR-5243 CNRS-Université Montpellier) - López-Cachero, Javier (Universitat de Barcelona, Departament d'Història i Arqueologia- SERP)
Presentation Format: Oral
- Metal findings and iconographic evidences related to horses suggest that these animals had a strong symbolic value and became major prestige items in Bronze Age and Iron Age societies from the NE of the Iberian Peninsula. The research developed in the frame of the project 'Mobility, contacts and exchanges during the Late Bronze Age and Early Iron Age in the north-east of the Iberian Peninsula: the Ripoll River (Barcelona) as a laboratory' (PI: J. López Cachero) included a pilot study on six Iron Age horses from the site of Can Roqueta to explore their geographical origin by the means of strontium isotopes ($87Sr/86Sr$).

The strontium isotopic study included the analysis of six archaeological horse enamel samples. In addition, the local strontium ratio was assessed by the means of three dentine samples from the archaeological site, and the bioavailable strontium around the site was evaluated on oak leaves from two different locations. In addition, other 10 present-day tree samples from different geological formations around the site were used as a comparison. The results obtained indicate that some of the strontium ratios from archaeological horse enamel are compatible with the local geology and neighbour formations. Nevertheless, a more distant origin cannot be excluded, as lead isotopic studies on bronze objects recovered at the site indicate that copper ores from the area of Les Cévennes (Southern France) were used to make a Mialhacian arrowhead and a double-spring fibula, which supports the existence of long distance trade at the site (Rovira et al., 2008).

References:

Rovira, M. C.; Hunt, M.; Montero, I.; Rovira, S. y López Cachero, F. J. (2008): "Caracterización isotópica de bronce de la necrópolis protohistórica de Can Piteu-Can Roqueta (Sabadell, Barcelona)", VII Congreso Ibérico de Arqueometría (Madrid 2007), 448-457.

271 **ROCK-CUT ARCHITECTURE: COMMUNITIES, LANDSCAPES AND ECONOMY**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Lamesa, Anaïs (IFEA) - Yamaç, Ali (OBRUK, Cave Research Group)

Format: Regular session

Rock-cut architecture are known since prehistoric times. These kinds of buildings, carved out from solid rock, is widespread throughout of ancient communities. On their walls, this particular architecture preserves stratified layers that relate of their carving process and/or of their use. They are like vertical test-pits that archaeologists can study.

All over the world, people carved architecture into mountainsides or out of isolated boulders for religious, social or economic purposes. These buildings can have the shape of chapels, churches, tombs as well as houses, channels, cisterns, granaries, etc. Thus, these specific archaeological sources help scientists to understand how communities or individuals have interacted with their landscape and have shaped it.

Studying them is necessary to explain the economic dynamics, the technological advances, the lifestyle of communities and the symbolic beliefs. This session is interested in papers that raise theoretical and methodological issues, in order to discuss the state of the art in the field of rock-cut architecture studies. It is open to students and scholars who use different methods for the study and the conservation of this peculiar archaeological feature regardless of period or socio-cultural context.

ABSTRACTS

1 **A ROCK-CUT LANDSCAPE BY THE SEA: MYRINA KASTRO IN PREHISTORY AND ANTIQUITY (LEMNOS ISLAND, GREECE)**

Author(s): Marangou, Christina (Independent researcher)

Presentation Format: Oral

On-going surface and sub-surface research on rock-cut structures and related mobile finds at Myrina Kastro, a hilly peninsula that delimits the present main port of Myrina (Lemnos island), has revealed vestiges dating from various phases, at least since the Bronze Age to the Hellenistic period, in several extended areas.

During these stages, human action has influenced the landscape, which, at the same time, has guided choices of natural forms and spaces and induced modes of operation. Natural rocks and a variety of combined artificial rock-cut features, including rock-art, appear to have both symbolic and utilitarian components, concerns and purposes. They reveal a complex rocky landscape, entailing an elaborate artificial system of space occupation, including intercommunicating carved features.

According to the current stage of research, besides other functions, the Kastro rock-cut site should also involve intricate maritime facets and connections, such as nautical representations, as well as a possible female bias, congregating at a transitional place, where sea and rocks meet.

2 **FROM SURFACES TO TOOLS: TRACEOLOGY AND EXPERIMENTAL ANALYSES OF DIGGING TECHNIQUES OF MEDITERRANEAN ROCK-CUT TOMBS**

Author(s): Porqueddu, Marie-Elise - Bailly, Maxence (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence) - Melis, Maria Grazia (Università di Sassari, Dipartimento di Storia, Scienze dell'Uomo e della Formazione, LaPaRS) - Margarit, Xavier (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence) - Fallavollita, Paolo (Oben srl, Sassari)

Presentation Format: Oral

Rock-cut tombs are present, at the end of Prehistory, in Sardinia and in the south of France. A large literature is dedicated to these monuments, but the study of the digging process remains poorly discussed. This topic has been the object of a PhD research and a research program developed and funded by the Galilée program from the Université franco-italienne. This program focuses mainly on the study of the surfaces in rock-cut tombs. The question of the walls' surfaces from Sardinian and French hypogea is essential for the understanding of the realisation of these monuments and the action taken during the digging process. This research goes through the study of the walls, more precisely the digging traces, and the study of the macro-lithic

tools used for the excavation. The study of excavation traces on the walls is complex because of the state of conservation of the monuments but also of the treatments applied on the walls. Indeed, many hypogea are characterized by the presence of a specific treatment on the walls comprising a smoothing and/or the realisation of sculpture and engraving. Many Sardinian hypogea also have painted representations. Similarly, these artificial cavities have many problems of conservation. The walls suffer from moisture and vegetation as well as vandalism. In these circumstances, it is necessary to develop a non-invasive study technique to obtain quality data. In this prospect, we chose to set up a photography and photogrammetry method complemented by an experimental protocol. We focused on the differences of treatments that can be observed on the walls of hypogea as well as on the techniques and tools used in the excavation of these underground architectures. In this communication, we will expose the methodology adopted and the results obtained within the Galilée program.

3 RECONSTRUCTING AN EXTINCT TYPE OF ARCHITECTURE AT THE SIXTH NILE CATARACT

Author(s): Varadzin, Ladislav (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Varadzinová, Lenka (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Pacina, Jan (Department of Informatics and Geoinformatics, Faculty of Environment, J. E. Purkyně University in Ústí nad Labem)

Presentation Format: Oral

Evidence for light architecture characteristic in particular of mobile societies is difficult to detect archaeologically. In this paper we investigate such evidence in the form of narrow cylindrical holes recorded on vertical and inclined walls of granite boulders in the Czech archaeological concession in the western part of Jebel Sabaloka at the Sixth Nile Cataract (Sudan). Based on the actual evidence, thorough documentation and virtual experimental reconstruction, we interpret these holes as remains of wooden pole-built structures, some of which may have been dwellings. The structural design is indicative of mobile or semi-mobile communities whose territories consisted of a network of stable points or camps. Our aim is to highlight what can be considered a significant category of North African archaeological and architectural evidence which has, so far, received only limited attention. In addition to researchers concerned with areas where remains of prehistoric or historical occupation are tied to rocky environments, it may be of interest to those concerned with secondary squatting occupation remains within monumental architecture not only in Northeast Africa.

4 THE ROCK CULTURE IN THE EASTERN RHODOPES - NEW DATA FROM ARCHAEOLOGICAL EXCAVATIONS IN THE ROMAN AND PRE-ROMAN TIMES

Author(s): Dimitrov, Zdravko (National Institute of Archaeology with Museum - Sofia)

Presentation Format: Oral

Over the past twenty years, a number of active archaeological excavations have been carried out in the region of Eastern Rhodopes. The studies of Prof. Ovcharov (Perperikon and Tatul) and Assoc. Prof. Dimitrov (Perperikon, Tatul, like deputy Head of excavations, Benkovski and Angel Voyvoda) led to the accumulation of a huge amount of new data on the development of the so-called Rock culture in this region of Ancient Thrace.

This is one of the areas in today's Bulgaria, which have the most developed archaeological complexes, cut entirely in the rocks. Together with the neighboring Strandzha and Sakar Mountains, many megalithic monuments are found in the Eastern Rhodopes, but besides them, we always see the full use of the rock as a building material and the foundation of all the facilities.

Chronology in the appearance, development and distribution of these strong traditions in rock processing is wide. It dates back to the Bronze Age – in the 2nd millennium BC – and continues without interruption until the end of Antiquity (7th century AD).

Thus, for more than two millennia in the Eastern Rhodopes complexes have been built in the rocks – sanctuaries, rock niches and crevices, altars, but also reservoirs, water-supply systems, fortress and fence walls, whole rock buildings. For example, at archaeological sites Tatul and Angel Voyvoda have excavated some of the most interesting rock tombs in Bulgaria. On the largest site Perperikon a whole rock city is built in Late Roman times – fortress walls of several zones, tanks, rock buildings and streets, temples and public buildings, even entire church complexes.

The purpose of the presentation is to present these new field data, which completely change our view of this Thrace region during the transition from prehistoric times to the Antiquity.

5 ROCK-CUT FISHERIES AND SALT-PANS, THEIR BUILT LANDSCAPE AND NATURAL ENVIRONMENT, IN MESSINIA, SOUTH GREECE

Author(s): Germanidou, Sophia (Greek Ministry of Culture)

Presentation Format: Oral

Fish breeding in artificial, rock-cut tanks was a method widespread applied especially from Roman times, regained popularity in the Middle Ages. Archaeological vestiges of such installations, which are rare to still locate and difficult to identify, date mainly from that periods. Even fewer are scholarly known across the Mediterranean countries such as in Spain, Portugal, Italy, Cyprus, Turkey and Greece where Roman fish tanks from Crete were identified and published many years ago. However, no particular academic advance was made since then in the investigation of rock-cut fisheries notwithstanding their importance as archaeological finds, economic product and perfect example of utilization of natural and environmental resources. In the present paper, two previously and almost totally unknown rock-cut fisheries are introduced, one located around a Roman villa and the other on a castle, in the province of Messinia, South Greece. Noteworthy is that, usually, fisheries are accompanied by other activities such

as quarries and salt-pans, which we will also briefly demonstrate.

6 VALLEY OF 1000 CAVES

Author(s): Yamac, Ali (OBRUK)

Presentation Format: Oral

Without a single architectural feature or archaeological finding regarding the period when it was excavated, it is very difficult to date a rock dwelled structure because these structures have always been used throughout the history by being changed and some of them are still being used even today. This problem, which is even applicable to only one structure, becomes much more significant if you work in a valley, containing hundreds of engraved rock structures. Kayseri (Caesarea, Mazaca) was the capital of ancient Cappadocia during the Roman and Byzantine era. Soft volcanic rocks, caused by a million-year volcanic activity which continued up to historical periods in the region, are observed in all over Kayseri Province just as the other areas within Cappadocia as well as the numerous structures, excavated in those volcanic rocks. Within the scope of a five-year study, Kayseri Underground Structures Inventory Project, previously unpublished numerous underground cities, churches, dovecotes, even rock dwelled villages were explored. As the most important part of this study; in Koramaz Valley, 16 km in length and incorporating six different rock dwelled villages therein, 476 rock-cut structures were explored and surveyed up to now. Although most of them are houses and barns, there are also 34 churches, 11 underground shelters and tens of dovecotes and/or columbariums. We also observed that many structures, likely to be Roman rock-cut graves due to their architecture and kline-style designs, turned into storages in time. Likewise, some structures, considered to be Roman columbariums, turned into dovecotes. Although the only structures, periods of which were exactly determined, are the churches, dated between 7th and 11th centuries, some of the rock-hewn settlements in Koramaz Valley may be excavated much earlier as a part of rock-hewn settlement tradition for thousands of years.

7 CARVING PROCESS AND CONSTRUCTION SITES OF ROCK-CUT MONUMENTS IN THE TIGRAY REGION: A NEW PROJECT

Author(s): Lamesa, Anaïs (IFEA) - Atsba Hailu, Hailay (Adigrat university)

Presentation Format: Oral

Ethiopia is well-known for its rock-cut sites located in its northern part. Since 2010, a new research program mainly held in Lalibela – a site registered by the UNESCO – studies carving process of medieval churches and monasteries.

Tigray region is another area, about 400 km north of the famous UNESCO site, where a lot of rock-cut churches can be found. There, monuments are carved on the top of hills (Imba) or in hollows inside the valleys.

Some of these rock-cut churches have been studied by art historians but there is no archaeological analysis of these monuments.

Through three case studies, this paper aims to point how the construction site of these monuments can be analysed by proposing two approaches:

The first is technical and geological. It proposes to explain the carving process used to create the building and choices made by stoneworkers to avoid geological difficulties.

The second is ethno-archaeological. These churches are still in used today, construction legends and manual techniques to restore them being still known by villagers and monks. As a result, the collection of testimonies is an opportunity to discern economic and cultural issues in communities living in and with these rock-cut monuments.

8 DIGGING AND DESIGN OF SOUTERRAINS IN FRANCE

Author(s): Stevens, Luc (Société Française d'Etude des Souterrains)

Presentation Format: Oral

Souterrains are man-made caves excavated in order to allow the members of a community to live on a temporary basis underground. Most of these cavities were dug between the 11th and 16th century follows a precise planning and are designed on a human scale. They are composed of various galleries deserving one or several rooms intended to be occupied by the member of the community. Therefore, we find in those souterrains utility structures like water well or spring, niches to put lamps or objects of the daily life, stone benches, vent pipes, ... A large number of these souterrains have received a defensive function. In this case, they are equipped with wooden doors blocked by a wooden bar or a sliding bar, horizontal and vertical narrow passages, loopholes, trap wells. In other souterrains a storage function is evidence by the existence of grain silos. Finally, some of these souterrains have also served as an extension of housing.

At the difference of the medieval mining industry that is documented by first hand document like the one of Agricola, there is no information on the design and the conception of souterrains. The hidden nature of these souterrains may be a reason for this absence. However, a thorough analysis of those souterrains, of their relations with structures in surface, of hewing allows to draw some lessons on the planning of those souterrains, on the different digging phases and on the blueprint of these cavities. From the strategic decision of the place where the souterrain will be created to the is final operational use, several elements like extraction shafts, vent pipes, landscape morphology allow to understand the digging process of those souterrains.

9 GODS ENCHANTED IN STONE. STUDIES OF AZTEC MONOLITHIC TEMPLES

Author(s): Prusaczyk, Daniel (Institute of Iberian and Ibero-American Studies, University of Warsaw)

Presentation Format: Oral

Despite the extremely developed technology and richness of architectural forms in the Aztec culture, only few of pre-colonial buildings have survived to this day in Central Mexico. The few palaces, pyramids and aqueducts that survived the Spanish rule are the most popular destinations for tourists and researchers in the region. Still ongoing researches in Mexico City extend our knowledge about Aztec architecture.

At the same time, rock-cut constructions are much less popular. The technology of forging buildings in the rock was not common in the Aztec world. Only several rock-cut structures have survived to this day, especially in archaeological sites of Malinalco and Tetzcotzinco. These remains of temples are one of the most enigmatic remnants of this pre-Hispanic culture.

The aim of the paper is to present the preliminary results of analyses on the monolithic Aztec temples. These studies include both technical issues and an attempt to interpret these structures. The paper includes the results of modern documentation (such as 3D scanning) of the architectural remnants, especially from Tetzcotzinco. The entire documentation was used to elaborate the construction issues of these temples. Also we were trying to track the changes in their form in recent centuries. In conclusion, I will present a broader analysis of the context and the sites of Malinalco and Tetzcotzinco, which will answer questions about the function and use of monolithic temples and their significance in the Aztec worldview.

10 RENAISSANCE-ERA ROCK CUT CELLARS IN THE ECONOMY OF A FORITIFIED CITY IN THE WAR FRONTIER BETWEEN TWO CIVILIZATIONS

Author(s): Mino, Martin (Monument Board of Slovak Republic)

Presentation Format: Oral

The town of Krupina located between the winemaking and mining regions of central Slovakia made a significant profit from wine trade, especially after the 1526 battle of Mohacs. Soon after this the once inland town appeared directly on the border. Not only a political border but on the cultural border of the Islamic and Christian world as well, with the Ottoman Empire becoming its neighbor. This new situation together with favorable natural conditions and specific location of the town, made Krupina's wine trade crucial.

In order to protect the town's profitable activities from the tumultuous events at the frontier, the town developed a specific system of extensive storage rooms in a relatively small area encircled with town walls, in the form of underground cellars carved in rock. While some of this underground rock cut architecture remains inaccessible due blocked entrances, the others are partially inaccessible due to their location on private properties. Monument Board of Slovak Republic has attempted to map and evaluate the entire later category, which but for one instance was a success. The obtained data was then placed into the context of the historical and contemporary political situation and with the results of non-destructive landscape survey in the bounds of the town's cadaster. This contribution examines the origin, mapping and assessment of this phenomenon at this site which is unique in the area of Slovakia as well as the perspectives of its protection and use for the community.

11 CUTTING IN THE CHINESE LOESS

Author(s): Canavas, Constantin (Hamburg University of Applied Sciences)

Presentation Format: Oral

A particular cave-like construction – underground, in a lateral cliff, or as extension of the ground – is known under the name yáodòng on the Loess Plateau across the Huanghe (Yellow River) in North-Central China. The typical soil, loess, originates from yellow-grey wind-carried sediments and is highly subdued to erosion processes. Human use of the soil has a long tradition documented e.g. in Neolithic sites with “pocket-form” shelters dug in the loess. Digging or cutting dwellings in the loess continues in several forms and regions along the valley of the Yellow River till the present.

Conventional interpretation models explain the act of digging-out the space by the function attributed to the (final?) resulting form – living, working, or depositing – such ensembles being summarised as troglodytic architecture. Focusing on the presumed purpose such approaches even use questionable expressions such as “constructed (or built) caves in natural holes”. The present study refers to published evidence on spaces dug-out in loess in the valley of Yellow River through an approach of prehistoric archaeology originally implemented on Neolithic pit-housings in Europe. The approach focuses on the acts of digging and shaping the hole or pit as social actions themselves – not necessarily bound (solely) to the function of the pit. This approach enables new modes of understanding e.g. the collective engagement of the community in the process of digging pits in the loess soil or of constructing rammed-earth walls from loess as *mise-en-matière* of collective memory. The particular significance of the digging act may extend beyond historically and regionally variable patterns of its relation to the explicit or implicit function of the construction form. Layers of significance may be related to (earlier) expressions of social interactions and social linkage, thus providing space for revealing symbolical relations between human actors and the various forms of cut soil.

THE ROLE OF ROCK-CUT ARCHITECTURE IN THE SHAPING OF THE ARCHAEOLOGICAL LANDSCAPES OF CENTRAL SICILY

Author(s): Giannitrapani, Enrico (Arkeos - Servizi integrati per i Beni Culturali s.c.)

Presentation Format: Oral

Rock-cut architecture is a key constitutive element of present-day archaeological landscape of central Sicily. The inner part of the island, in fact, is characterized by the diffused presence of steep limestone, sandstone and flysch outcrops, widely distributed in the territory: because of their geomorphological structure, almost all these outcrops have been easily modified by human intervention. From prehistory up to last century, a simple technology has been employed to excavate these rocks, producing in this way a vast heritage of "negative" architectures, used as prehistoric burials, but also, in the following periods, as defense or cult places, for crafts and agricultural production or as housing structures. Besides being important territorial markers in the countryside, many modern urban centres of the region have been developed around, or above, some of the most impressive rock-cut structures. In the paper, a general outline of the long-term development of rock-cut architecture will be presented, together with considerations about its role in the making of the cultural, ritual and economic aspects composing the different landscapes of central Sicily. This analysis is partly hindered by the difficulty to date these structures. Because the long use, and re-use, of these artificial cavities, often they are found, in fact, without any clear evidence of their original deposits. Furthermore, the technology used for their excavation is very conservative through the centuries, with only the more recent ones which are identifiable for the use of metal tools: in order to recognize, catalogue and date the numerous examples present in central Sicily it is necessary to apply a contextual and historical analysis of the different societies who produced and used these rock-cut structures. The paper will conclude with some key examples how such an important historical heritage is used today by local communities and archaeologists for sensible projects of public archaeology.

A. CART-RUTS IN WESTERN SICILY

Author(s): filippi, antonino (Independent researcher)

Presentation Format: Poster

The term cart-ruts defines road routes characterized by parallel grooves dug in the rocky bank, sometimes even tens of cm in depth, which are believed to have been left over the centuries by vehicles, probably carriages or sleds. It's certainly the first traces of stable road system we have met along the coasts of the central Mediterranean (Sardinia, Sicily, Malta, Tunisia). The presence of cart-ruts in Sicily has never been the subject of specific studies, unlike, for example, in neighboring Malta where these road structures have been well studied and dated back, in some cases, to an epoch preceding the Punic colonization.

Only recently, in Sicily, in the territory of Mazara, have been found cart-ruts cut from burial plots referable to the Archaic period, assuming that the road had been traced before the 6th or 7th century BC. Cart-ruts are present in Sicily especially in the western end and in the south-east of the island, where the morphology of the territory is characterized by the presence of large flat limestone terraces near the coast. On these terraces, countless quarries for the extraction of the building stone, connected to the routes of the cart-ruts, were active over the centuries.

The study has mainly taken into consideration the western territory of Sicily and the Egadi islands, where there are hundreds of parallel grooves dug into the rock, which have profoundly marked part of the coastal landscape. Unfortunately, these structures, now completely forgotten by the local communities, risk disappearing under the pressure of building expansion and new roads. As a consequence, this study wants to underline the important economic and cultural role of cart-ruts, with the intention/aim of starting a path of knowledge and protection of this important heritage.

B. SUNK COSTS: COMPARING MULTI-USE TOMBS IN ELEVENTH CENTURY BC ACHAEA

Author(s): Turner, Daniel (Universiteit Leiden)

Presentation Format: Poster

Late Bronze Age tombs in Greece have been a subject of fascination and study for centuries. Resurgent interest in the last 30 years has, not ironically, buried us in data. Fortunately, digital modelling and statistical analyses can offer a useful way to package ever-growing databases into a more manageable form. As part of a wider study on the comparative labour of Late Bronze Age tombs, I explore investment primarily in the construction and reuse of chamber tombs. Here, I present the results of correspondence analyses that group architecturally similar tombs at two large Mycenaean cemeteries in Achaea. The results carry methodological and contextual implications concerning the changes that occurred generations after the collapses of palatial centres in southern Greece. Clustering of multi-use, rock-cut tombs suggests many were constructed with size and shape classes in mind, and relative indexes ease future comparisons of tombs that reveal little on raw measurements alone.

CROP HUSBANDRY ACROSS THE IRON AGE AND ROMAN PERIODS: BRINGING TOGETHER THE PICTURE OF HUMAN-CROP INTERACTION ACROSS EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Lodwick, Lisa (University of Oxford) - Alonso, Natàlia (Universitat de Lleida) - Zech-Matterne, Veronique (CNRS) - Vadorpe, Patricia (Universität Basel) - Valenzuela Lamas, Silvia (Consejo Superior de Investigaciones Científicas)

Format: Regular session

Whilst European wide-narratives of changes in animal husbandry are available for the later prehistoric and Roman periods, with a shift towards cattle husbandry and an increase in animal size widely observed, the picture for crop husbandry remains fragmented. The study of crop choice and farming practice are crucial for examining how societies interacted with their landscape, and how these practices were shaped by changing climatic, and socio-cultural factors, namely the expansion of Phoenician and Greek influence, and later, of the Roman empire and the subsequent establishment of villa agriculture systems.

In terms of crop choice and cultivation practice, the Neolithic and Bronze Age periods have long received the bulk of attention in archaeobotanical analysis. However, after decades of archaeobotanical analysis in some regions of Europe (France, Germany, UK), and the more recent introduction of systematic sampling and analysis in other areas (Croatia, Bulgaria), large quantities of data are available in order to establish the major changes in crop husbandry across the first millennia BC and AD.

Recent large-scale research projects in the UK (Roman Rural Settlement Project), north-eastern Gaul (RurLand), and Iberia have begun to draw undertake syntheses of crop data, providing regional narratives including shifts in some regions from an Iron Age focus on hulled wheats towards the Roman cultivation of free-threshing wheat, while in the Western Mediterranean, free-threshing wheat and hulled barley are already the most common cereal species from the beginning of Iron Age.

This session aims to bring together researchers working across Europe to present regional syntheses in order to establish where and when the key shifts in crop choice took place, and to begin to evaluate the reasons why these changes happened – was the development of market-orientated crop production, shifts in culinary tastes, or local environmental factors more important for crop choice decisions.

ABSTRACTS

1 TRENDS IN CROP SELECTION IN EGYPT: COMPARATIVE PERSPECTIVES

Author(s): Hansen, Annette (University of Groningen) - Heinrich, Frits (Free University Brussels - VUB)

Presentation Format: Oral

This paper aims to engage with the rich tradition of crop selection in Egypt and its adjacent regions from the 1st millennium B.C. until the early Islamic period, with a focus on the Roman period. It aims to assess the different crop chronologies that have been forwarded over the past century and improve them with additional, interdisciplinary data. In Egypt historians (and papyrologists) have long been interested in shifts in crops cultivated, yet the traditions of the historians and archaeobotanists have remained largely separate. The paper furthermore aims to compare crop chronologies within and beyond Egypt. It will assess the differences in crop selection between the Nile valley, the Fayum depression and the Western Desert Oases on the regional level, but also make the comparison with Libya and 'Africa' on the interregional level. A special focus will be on Nubia (Sudan), a region long recognized as a corridor for the spread of crops and farming technologies as well as region just beyond the Roman frontier, which allows us to obtain both insights into the diffusion of crops as well as the effects of being, or not being, part of the wider Hellenistic and Roman world on crop selection. Within this paper hydrology and technological innovation/diffusion will be key concepts as well as the integration of areas into wider economic networks.

2 INVESTIGATING REGIONAL VARIATION IN PLANT FOODS IN THE ROMAN EAST

Author(s): Feito, Jessica (University of Reading)

Presentation Format: Oral

Archaeobotany has a long history in the Near East, with many sites incorporating archaeobotanical sampling into their excavation strategy. However, much of this research has been focused on early prehistory and topics including the advent of agriculture, while crop choices in the Iron Age, Hellenistic and Roman periods have received far less scrutiny. Furthermore, while regions such as north-western Europe, Britain, and, more recently, the Iberian Peninsula have been subject to synthetic studies that highlight the large-scale shifts in plant production and consumption that occurred during the Roman period, these trends remain largely unexplored in the Near East.

In other provinces, the Roman period saw interesting shifts in crop plants, as well as the introduction of new plant species, which may be linked to the increased economic integration and higher degrees of connectivity, as well as the expression of new identities. However, as the Near East had a long history of urbanism and infrastructure prior to the arrival of the Romans, the patterns detectable in the archaeobotanical data may reflect interesting differences in the effects that incorporation into the Roman empire did or did not have in the region.

In this paper, secondary data from the later Iron Age, Hellenistic, Roman, and Late Roman periods is collated and combined with new primary data from two cities of the Decapolis in order to shed light on the broader changes that occurred in plant consump-

tion as well as in the greater agricultural economies. Key findings include a general decrease in glume wheats over time, as well as regional differences in the representation of fruits.

3 CROPS, CULTURE, AND CLIMATE IN ANCIENT ANATOLIA

Author(s): Rowan, Erica (Royal Holloway, University of London)

Presentation Format: Oral

Ancient Anatolia was a region of great cultural diversity and interaction, the place where east met west. It is also a large and climatically diverse area, encompassing coastal Mediterranean regions, semi-arid steppe grasslands and the Taurus Mountains. The Iron Age saw the rise of the Phrygian and Lydian empires followed by the Persians, the Seleucids and eventually the Romans. In addition to differing attitudes regarding urbanization and social hierarchies, each of these dominant groups had differing crop husbandry beliefs and practices. However, despite the region's vast cultural and climatic variation, archaeobotanical work has focused almost exclusively on Neolithic and the Bronze Age sites. Yet there exist a small number of sites that were both occupied almost continuously from the Bronze Age to Late Antiquity and have been subject to proper archaeobotanical sampling. These sites, namely Sardis, Sagalassos and Gordion are each situated in differing climatic regions and have vastly different occupation histories. The earlier absence of data, especially from the Roman period, has meant that previous analysis of crop husbandry practices in Anatolia have remained patchy and incomplete. This paper will therefore present an updated regional synthesis of crop cultivation from the Iron Age onwards, focusing on the interwoven yet at times conflicting roles of climate and culture.

4 C4 PLANTS IN THE DIET OF ANCIENT PHANAGORIA INHABITANTS: ISOTOPIC EVIDENCE

Author(s): Svirkina, Natalya (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Phanagoria is one of the largest antiquity sites on the territory of the Taman Peninsula (Black sea region, Krasnodarsky district, Russia). The population of the antique city surrounded by the local groups. Agricultural patterns of economy in the region can be considered as evidence of barbaric or antique traditions. Archaeobotanical study of cultural layers of antique settlements and cities from VI BC till III AD determined the main cereals: the wheat and barley. Millet is often for the cultural layers of the Scythian and Meotian settlements. Millet meals are typical for the Early Iron Age nomads of Eurasian steppes and for the indigenous groups of the Caucasus. Consumption of a significant amount of millet (C4 type of the photosynthesis) can be evidence about the barbaric traditions of nutrition and agriculture. The isotopic analysis ($^{12}/^{13}C$, $^{14}/^{15}N$) was used to estimate cultural and time-related dynamics of the Phanagoria's inhabitants diets during three periods: Hellenistic (III-I BC), Roman (I-III AC) and Late Antique (IV-V AC). The bone tissue of 75 samples of human and 11 animal bones and 2 samples of ancient barley and millet were success to do mass-spectrometry analysis. The results show a high individual diversity of food preferences of ancient Phanagoria inhabitants. Perhaps, this is the social and cultural differentiation of the population. The Roman and Late Antique groups are characterized by higher values of delta carbon than samples from the burials of the Hellenistic time. Thus we have background to assume that this dynamics is the result of the barbaric influence to agriculture and nutrition of the Phanagoria inhabitants of the late periods (Roman and Late Antique).

5 SHIFTS IN DIET AND CROP HUSBANDRY PRACTICES DURING THE FIRST MILLENNIUM BC AND AD ON THE TERRITORY OF BULGARIA

Author(s): Hristova, Ivanka (Environmental Archaeology Lab, Umeå University) - Marinova, Elena (Laboratory for Archaeobotany, State Office for Cultural Heritage Baden-Württemberg)

Presentation Format: Oral

Significant changes are observed in the staple crops utilised during the first millennium BC and AD in South-Eastern Europe. The aim of the current presentation is to trace these shifts from the beginning of the Iron Age to Late Antiquity in the territory of modern Bulgaria and to explore the possible reasons for these changes at regional and sub-regional scales. The study is based on the author's own data and current publications dealing with archeobotanical remains as indicators for the diet of the ancient population and the shifts in agricultural practices.

The second half of the 1st millennium BC is the transitional period when the hulled wheats were replaced by free threshing wheats. During the 1st millennium BC millet was one of the main cereal crops. It continues to be used in the later periods but its finds are more sporadic. Barley was also very common crop although during the different periods its importance changes. During Late Antiquity rye started to be cultivated in the study territory, a crop which is more typical for the northern regions of Europe. Apart from cereals several leguminous crops (lentil, bitter vetch, pea, grass pea) contributed to the diet of the ancient population during all of the study periods. Later, during the Roman period broad bean was added to the spectrum of leguminous crops, while chick pea gained importance during the Byzantine period. From the beginning of the Iron Age onwards we see the increasing importance of fruits and oil plants comparing to the previous periods. The presence of imported species also increases, especially during the Roman period.

The evidence considered will be also interpreted in terms of possible indications for changes in human impact on the landscape through the considered period.

- 6 CROP GROWING CONDITIONS AND CLIMATE VARIABILITY IN WESTERN CATALAN PLAIN DURING IRON AGE AND ROMAN PERIODS**
Author(s): Alonso, Natàlia - Aguilera, Mònica - Vila, Sílvia - Voltas, Jordi (University of Lleida)
Presentation Format: Oral
- Cereals are the best represented crops grown by the Iron Age populations in the western Catalan plain (Catalonia, Spain). Naked wheats and hulled barley can be considered predominant even during the Roman period over the other cereals (emmer, millets or oats). On the other hand, pulses are very rare both in Iron Age and Roman times, although lentil, pea, broad bean and grass pea are found. The remains of grapevine start to be frequent in the 4th century BC.
- As in other parts of Europe, the greatest contribution of the Roman world to agriculture in western Catalonia is the introduction of new varieties of fruit trees. The early Roman period, 2nd – 1st c. BC provides us with new tree taxa: walnut, peach, and olive. During the Imperial Roman period, apple/pear can be added.
- In this paper, we intend to document the evolution of the cultivation conditions of naked wheat and hulled barley, during periods of climatic variability documented by isotopic discrimination of $\delta^{13}C$ in wood charcoal of Aleppo pine and evergreen oaks. These show a period of low precipitation at the beginning of the Iron Age, with an increase towards the 5th c. BC that culminates with high levels in the 1st c. AD. The isotopic analysis of $\delta^{13}C$ and $\delta^{15}N$ of a hundred samples of grain from nine sites, allow us to offer an overview of the conditions of cultivation and soil fertility in relation to the climatic variability demonstrated by the charcoal analysis.
- 7 CHANGES IN CROP CHOICES AND PLANT HUSBANDRY PRACTICES, BETWEEN THE IRON AGE AND ROMAN PERIOD IN NORTH-EASTERN GAUL**
Author(s): Zech, Veronique (CNRS, MNHN Paris)
Presentation Format: Oral
- The ERC program Rurland: “Rural Landscape in north-eastern Roman Gaul from the late La Tène Period to late Antiquity” (Advanced Grant 2013, N°338680, dir. M. Reddé, EPHE, Paris, 2014-2018) offered the opportunity to gather carpological data related to 655 archaeological settlements dated from the 2nd century BC to the end of Antiquity in the north-eastern quarter of Gaul. This vast survey revealed local changes in agriculture that occurred between the end of the Iron Age and the rise of the Roman Empire and allowed regional variations in crop production and land management to be related to changes in livestock farming. The main categories of food plants, including fruit trees, will be examined to see how they interacted and fluctuated over time. Complementary approaches, such as isotopic geochemistry (especially $\delta^{15}N$) carried out on charred cereal grains and functional ecology applied to arable weed flora, enable a more detailed discussion of agricultural practices.
- 8 SPECIALISATION IN SPELT: ARCHAEOBOTANICAL EVIDENCE FOR SHIFTS IN ARABLE PRACTICES IN ROMAN BRITAIN**
Author(s): Lodwick, Lisa (University of Oxford)
Presentation Format: Oral
- At the north-western edge of the Roman world, the province of Britannia has been marginal to debates on the Roman agricultural economy. However, a long history of archaeobotanical research, especially through developer-funded archaeology, has produced a wealth of data with which to assess crop choice through time. Here, the results of the recent Rural Settlement of Roman Britain project are reviewed, which collated archaeobotanical data from 2523 rural settlements.
- An assessment of this dataset shows that whilst there are environmental trends affecting crop choice (more barley on calcareous soils) and some chronological patterns (increase in rye, oats, and free-threshing wheat through time), the overwhelming picture is of a reliance on spelt wheat and barley. This study provides strong evidence for specialisation in these two crops across Britain, but overall the pursuits of similar strategies in crop choice between farmsteads and villas. However, insights into crop husbandry choices in this study were limited by data quality.
- To rectify this, a recent suite of crop stable isotope analysis ($\delta^{13}C$) and ($\delta^{15}N$) on sites in two key farming regions (the Nene Valley and the Hampshire Downlands) has shown that $\delta^{15}N$ values decrease from the Mid Iron Age through to the Late Roman period, indicating an extensification in arable husbandry. This pattern indicates that surplus cereal production was achieved through increasing the amount of land under cultivation, rather than increasing labour inputs per unit area. The similarity of growing conditions of barley and spelt wheat indicate a conservative approach to maximising agricultural production in this period.
- 9 AGRICULTURAL AND ENVIRONMENTAL CHANGE IN IRON AGE IRELAND**
Author(s): McClatchie, Meriel (University College Dublin) - Dillon, Mary (Independent) - Becker, Katharina - Gearey, Ben (University College Cork) - Armit, Ian (University of Leicester) - Eogan, James (Transport Infrastructure Ireland) - Fiocoprile, Emily (University of Bradford) - Hegarty, Susan (Dublin City University) - Hull, Graham (TVAS Ireland Ltd) - OCarroll, Ellen (Independent)
Presentation Format: Oral
- Agriculture in northern Europe during the Bronze Age is often considered to have provided a strong basis for economic growth and emerging social power. In Ireland, there is extensive archaeological evidence for farming during the Late Bronze Age (1200–

700 BC). Significant changes in environments and societal organisation then occurred, affecting what and how people were farming. Evidence for farming is rather difficult to detect during the Early Iron Age (700–400 BC), coinciding with a time of climate change. This may reflect dramatic collapses in societal organisation and crises in food-management strategies, or more simply reorganisation of food systems. By the time of the Developed Iron Age (400 BC–AD 1), evidence for farming is more easily recognisable in the archaeological record, coinciding with the beginning of so-called Celtic migrations. Detailed research has been undertaken in recent years on the timing and nature of environmental change during these centuries, particularly in relation to climate. A detailed understanding of farming practices is, however, less well developed. Extensive archaeobotanical data from excavations have become available over the past two decades. Despite this availability of data and the recognised importance of changing farming practices during the Iron Age, detailed analysis of what was being farmed, and how farming was undertaken, is often absent from archaeology narratives. To address this issue, an INSTAR-funded research project was established, “Settlement and Landscape in Later Prehistoric Ireland – Seeing beyond the site”, which aims to contextualise the archaeology of Late Bronze Age and Iron Age Ireland within its contemporary prehistoric landscape, focusing on farming strategies and broader landscape interactions. This paper will reveal how collation and analysis of archaeobotanical data has enabled new insights into farming practices in Iron Age Ireland.

10 A META-ANALYSIS OF CEREAL CROP SELECTION IN THE ROMAN WORLD. TOWARDS A NEW SYNTHESIS

Author(s): Heinrich, Frits (Free University Brussels - VUB)

Presentation Format: Oral

Over the past years archaeobotanists have become increasingly interested in crop selection, as the concept may aid in modelling past agricultural decision making and elucidate diachronic changes in the rural economy. Therefore, they have endeavoured to determine diachronic changes in the crops which were cultivated ('crop shifts') by constructing so-called 'crop chronologies' (i.e. qualitative time series of archaeobotanical data) and have tried to explain the trends that arose from their data. As a result of these efforts, reviews of the archaeobotanical evidence from various regions and for various sets of crops are now available.

This paper aims to synthesize and integrate the regional trends in crops selection, solely for the crop category of the cereals, from several regions into two meta-trends. It then sets out to explain these trends through linking them to macro-economic trends and economic historical data: among others the trend towards a gradual increase of market integration in the Mediterranean basin, which culminated during the Roman Empire into what could be defined as the first 'single market', will be explored. The temporal focus of the paper will be on the Hellenistic to Roman periods. Geographically the focus of the paper will be on trends from three environmentally very different regions: Italy, Egypt and Britain. The trends in cereal crop selection in each of these regions will furthermore be compared with commensurable regions: Italy will be compared with Iberia and Southern France, Illyria, and the Alps; Egypt will be compared with Nubia and Libya up to Roman Africa; and lastly, Britain will be compared to the Netherlands. The paper will draw upon crop chronologies produced by the author supplemented by refined data from other published reviews.

273 PREVENTIVE ARCHAEOLOGY IN THE POST-MALTA AGE: THE CHALLENGES TO BE FACED

Theme: Archaeological theory and methods beyond paradigms

Organisers: Guermandi, Maria Pia (Istituto Beni Culturali della Regione Emilia Romagna) - Demoule, Jean-Paul (Institut Universitaire de France & Université de Paris I Professeur émérite de Protohistoire européenne; Ancien président de l'INRAP)

Format: Round table

EAA and the Malta Convention are almost contemporary, not by chance. Products of the same political and cultural context that has produced, among other things, undoubted progress on the level of professionalization of our discipline. At the same time, however, many problems still remain both as regards the archaeological activity on the field, the quality of scientific research, the working conditions of those who practice it, and for what concerns new challenges to the preservation of the archaeological heritage, starting from climate change.

On the side of cultural policies, the need for citizens' participation, not simply passive, to the activities of preventive archeology, is now unavoidable.

Finally it should be noted that in an increasing number of countries archaeologists are confined to a marginal role in the process of territorial planning.

In the session, starting from the results of the analogous sessions held in the previous EAA conferences, we will try to identify what tools can be used to face these challenges. And at the same time how the EAA can be involved in this process. In this way the Association could become the protagonist of an innovative process of cultural elaboration based on the collective intelligence of its members, its communities and task forces, including, first of all, the EAA Community for Organisation and Legislation.

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Reitmaier-Naef, Leandra (University of Zurich) - Thomas, Peter (German Mining Museum Bochum) - Hanning, Erica (Römisch-Germanisches Zentralmuseum Mainz RGZM) - Reschreiter, Hans - Kowarik, Kerstin (Natural History Museum Vienna)

Format: Regular session

Since prehistoric times, the acquisition, exploitation and processing of mineral resources has always been an operation that requires specific technical knowledge. This has led to the development of specialized technological complexes within each mining region adapted to the local requirements – be it environmental, economic or social in nature. Moreover, due to the geographic distribution of the exploited raw materials, many mining areas were initially located in the peripheries, but throughout time they became economic centers and even points of origin for technological innovation.

Exchange processes between mining areas also were likely. The spatial and chronological distribution of characteristic traits allows to draw conclusions about the presence of contact and trade networks. However, the exact quality and mechanism of these exchanges is often unclear: was the knowledge spread directly by the physical movement of specialists or more indirectly through middlemen? Likewise, there are cases where innovations - in spite of their spatial and temporal proximity - were apparently consciously NOT adopted. Thus, mining-related technology does not appear as an isolated occurrence, but as a component of a meshwork of different factors that regulated the work and life of the mining district.

This session will focus on a chronological and spatially comprehensive discourse of the modularity of technology transfer and its premises. Focus will be put upon the identification and characterization of knowledge transfer in the archaeological record, the roll of implicit knowledge in the spread of technological innovation, as well as the discussion of the reasons that help or hinder the expansion of new technologies. Papers dealing with diverse fields and contexts of raw material will be welcome. This includes, but is not limited to, archaeological research on mining districts, experimental archaeology, computer-aided modeling, as well as ethnoarchaeological examples.

ABSTRACTS

1 KNOWLEDGE TRANSFER AND TECHNICAL CHOICES IN PREHISTORICAL MINING COMMUNITIES: FROM THE THEORETICAL LEVEL TO ITS EMPIRICAL CONSEQUENCES IN MINING ARCHAEOLOGY

Author(s): Stoellner, Thomas (Ruhr-University of Bochum)

Presentation Format: Oral

Mining as one of the first professional undertakings is much dependent on the exchange of experiences and knowledge. The distribution of certain techniques such as the fire-setting, the black-powder-blasting technique or other smaller scaled technical solutions in mining, beneficiation and smelting processes is crucial to understand innovation and the change in production modes and thus social and cultural developments. In the lecture theoretical aspects of a sociology of knowledge will be considered to develop a better understanding and will be combined with experimental approaches as a practical way to understand steps of work and its embedded practical knowledge. I emanate from the basic differentiation of explicit and implicit knowledge complexes in order to understand various forms of knowledges embedded in techniques and their possible transfer between communities and individuals. This basic approach will then be confronted by case-studies by which the aspect of regionality and interregionality will be considered as important to understand the forms of transfer being most likely. Connectivity as theoretical model is a very important aspect in order to understand under which circumstances choices have been transferred, but so is also the adaptation within diverse geological, geographical and social contexts. The lecture will especially focus on case examples from Metal Ages' mining between the 4th and the 1st mill. BCE. between Europe, the Mediterranean and West- and Central Asia.

2 KNOWLEDGE TRANSFER IN ALPINE BRONZE AGE COPPER SMELTING PROCESS

Author(s): Hanning, Erica (Römisch Germanisches Zentralmuseum Mainz) - Goldenberg, Gert (Universität Innsbruck) - Anfinset, Nils (University Museum of Bergen)

Presentation Format: Oral

In many of the Middle to Late Bronze Age eastern Alpine copper mining districts, the smelting sites took on a surprising degree of uniformity in their layout, pointing to a broadened standardization of the operational sequence. Many of the sites also exhibit a surprising amount of longevity that can have periods of use spreading over several centuries. Thus the archaeological evidence points to transference of knowledge over generations within a single smelting district, while the generalized layout and construction of the sites also implies a dissemination of the technology between different copper producing districts within the eastern Alpine region.

Such temporal and spatial transference of a copper production technology can also be observed in traditional smelting techniques practiced in the Himalayas during the 19th and 20th centuries AD. A small-scale copper smelting operation was first described during the second half of the 19th century in the Mahanuddi Valley of Sikkim (present day India); the same operation, right down to the shape and layout of the furnace, the type of bellows, as well as the chaîne opératoire was still being carried out until very recently in the Okharbot village in western Nepal, roughly 540 km to the west. In over 150 years, no attempt was made

by the smelters to increase the volume of copper production by modernizing the smelting furnace or bellows; instead there was an almost stoic adherence to traditional methods.

This paper will look at the role of movement of people and ideas in the dissemination of copper smelting technology, pulling on the ethnographic accounts from Nepal and comparing them to the evidence from the Bronze Age Alpine smelting district, and how the society in general – particularly social structure and in the case of Nepal, religion, to a large degree frame the uniformity of practice.

3 THE SOCIO-ECONOMIC DIMENSION - A DIFFERENT PERSPECTIVE ON THE TRANSFER OF PREHISTORIC COPPER MINING AND SMELTING TECHNOLOGY IN THE ALPS

Author(s): Reitmaier-Naef, Leandra (University of Zurich)

Presentation Format: Oral

Various studies on mining and smelting technology in the Alpine region during the Bronze and Iron Ages have uncovered surprisingly uniform finds and structures from several centuries and vast areas. The archaeological relics testify to a certain degree of standardisation of the underlying technology, which gradually spread throughout the Central and Eastern Alps between the Middle Bronze and Early Iron Ages.

This large-scale and long-term transfer of highly specialised techniques, however, was subject to not only a technological but also a socio-economic dimension. In order to gain a better understanding of the economic and social dynamics behind Alpine copper production, it is therefore necessary to consider both technological and socio-archaeological aspects with a view to opening up the discourse that has so far exhibited a restricted focus on certain research areas.

It is precisely the dynamics of knowledge transfer and/or migration that need to be analysed at a higher level if processes are to be visualised that usually remain concealed at the microlevel, which is so frequently pursued.

This is especially true for the Laugen Melaun phenomenon in the Late Bronze and Early Iron Ages, which showed a striking overlap, both temporally and spatially, with the late copper production centres in the Central and Eastern Alpine region.

This paper aims to provide a preliminary examination of this question and formulates research perspectives for a more holistic approach to the study of the dynamics that were at play in the prehistoric copper production in the Alpine region.

4 SALT MINING IN THE CARPATHIAN BASIN IN 1650 – 800 BC

Author(s): Kavruk, Valerii (Romania: Iași - Al.I. Cuza University; Sfântu Gheorghe - The National Museum of Eastern Carpathians)

Presentation Format: Oral

The most substantial salt production sites in Transylvania and Maramureș date to ca. 1650 – 800 BC. The earliest of them (ca. 1650 – 1400 BC) are in the northeast Transylvania (Băile Figa and Săsarm). The sites are rich in timber structures: fences, roundish or rectangular structures, wattle-lined wells and multi-part constructions. Many wooden implements, tools and utensils have been found on these sites. The most emblematic of them are the ‘troughs’ made of massive tree trunks, with a wide lateral opening, axially perforated pegs inserted in the holes made in the trough base, and thin pointy sticks wrapped with vegetable fiber inserted in the peg’s orifices.

The ‘trough package’ includes multi-purpose production equipment. It could work with various materials: water and brine (wells, ‘troughs’, gutters and pans), mud (troughs, pans, paddles and shovels), rock salt (stone hammers and wooden wedges), crumbly salt (pans, paddles and shovels), as well as with timber (wooden sledge-hammers, splitting wedges, stone and bronze axes). All of these suggest that the so-called trough technique was part of a complex production system that has dealt with various kinds of raw material. Both the ethnographic analogies and experiments show the effectiveness of the ‘trough package’ implements in various kinds of salt production techniques: rock salt drilling (by fresh water jets), salt mud filtering, brine decanting or/and brine’s salinity rise.

Some implements and tools (stone mining tools, ladders, ropes, hammers, wedges etc.), as well as some presumed technique actions (rock cracking using wooden wedges and sledge-hammers, water evacuation) suggest that the ‘trough technique’ of salt production has been strongly influenced by or even rooted in copper mining techniques.

The ‘trough technique’ salt production appears to have been large-scale, high-tech and aimed at mass supply, and involved various social and professional groups.

5 COPPER AND SALT – NOT EXCHANGING?

Author(s): Reschreiter, Hans - Kowarik, Kerstin (Natural History Museum Vienna) - Thomas, Peter (Deutsches Bergbaumuseum)

Presentation Format: Oral

During the Late Bronze Age a surprising degree of uniformity and standardisation can be observed within the Eastern Alpine copper mining districts. While the Hallstatt salt mines are located in this zone of intense technological transfer, no evidence for technological exchange between the simultaneously operating salt and copper mining communities can be observed.

This observation is all the more surprising as a close link between copper and salt mining communities seems clearly indicated.

A high demand in copper by the Hallstatt salt miners can be evidenced. We furthermore hypothesize that the copper mining communities located in close proximity would have come in contact with the salt mining community through their need for salt. But although a good case for intense exchange between salt and copper can be made, technological exchange does not seem to have occurred.

The lack in technological exchange, as well as the fundamentally different mining and transport technologies observed in Hallstatt indicate discrete tradition of mining and specific training. Moreover for the Early Iron Age it can be demonstrated that no technological transfer occurred between the different salt producing sites in the Alps and the salt production sites in Transsylvania.

6 COPIED, TOLD, CARRIED – TRANSFER OF TECHNOLOGIES BETWEEN EASTERN ALPINE AND CARPATHIAN MINING COMMUNITIES

Author(s): Thomas, Peter (Deutsches Bergbau-Museum Bochum) - Ciugudean, Horia (Muzeul Național al Unirii Alba Iulia)

Presentation Format: Oral

The Carpathian Bronze Age is one of the richest epochs in European prehistory. Large quantities of bronze, copper and gold were deposited in numerous hoards and yet represent only a fraction of the material that was once in circulation. Despite rich deposits, mainly in the Romanian Carpathians, there is still no direct evidence of an independent primary production of metal. Rather, analyses indicate that alpine copper was imported into the Carpathians at least into the Middle Bronze Age.

With the beginning of the Late Bronze Age, indirect evidence can be found in Transylvania that point to an independent primary production of copper. Large quantities of raw copper must be regarded as products of this production. Alpine mining equipment, which appears together with other features of alpine traditions, allows the conclusion that the mining companies that are now tangible can be traced back to a technology transfer that was carried out by alpine specialists.

This paper presents preliminary results on the reasons and modalities for this technology transfer and on the impact it has had on the appropriation of raw materials in the Romanian Carpathians. The results were obtained in the context of a new project on ancient ore mining in Transylvania, which, since 2017, is a cooperation between Muzeul Național al Unirii Alba Iulia and the Deutsches Bergbau-Museum Bochum.

7 HOW TO DIG A HUGE FLINT NODULE? METHODS OF CHOCOLATE FLINT EXPLOITATIONS BY CHALCOLITHIC SOCIETIES IN CENTRAL POLAND

Author(s): Szubski, Michal - Budziszewski, Janusz (Cardinal Stefan Wyszyński University in Warsaw)

Presentation Format: Oral

Exploitation of flint raw materials is an indispensable and integral part of research into the manifestations of intergroup contacts of the Stone Age societies. This initial element of the chain operator takes on special significance in Neolithic and Chalcolithic when artefacts from specific raw materials spreaded several hundred kilometers from the original deposit. Around 4200 - 3600 BC, the Lublin-Volynian culture societies appeared in southern and central Poland. These were the southern societies with a specific, separated material culture, which advanced blade technology was main element. These communities were accustomed to very good and easily available flint raw materials from Volyn (modern Ukraine), characterized by large size of nodules. Different situation is in Poland. Despite the rich deposits of flint, it occur relatively deep underground in the bed rocks - limestone and chalk. For this reason, none of the known flint mines from Poland had been identified as the the Lublin-Volyn culture sites. This state of research changed in 2013 when the "Przyjaźń" site was identified for the first time with the materials analogous to those known from the settlement sites of these communities. The ALS and geophysical research carried out last year made it possible to identify the site as flint mine. This mine is located outside the geological occurrence of chocolate flints (Upper Jura), in a redeposited clay deposit. The material found at the site is very homogenous. It seems that it was used only episodically, during Chalcolithic period. It is a great rarity in the case of chocolate flint which were used from the Paleolithic to the Early Iron Age. It seems that representatives of the Lublin-Volyn culture specialized in flintknapping came to the Polish territory with new knowledge about the ways of location and exploitation of subsurface flint deposits.

8 TRADITIONS OF PRODUCTION: THE ROLE OF NEOLITHIC STONE QUARRYING IN THE DEVELOPMENT OF BRONZE AGE COPPER MINING, GREAT ORME, UK

Author(s): Wager, Emma (Independent researcher)

Presentation Format: Oral

A classic example of knowledge transfer between mining communities over time is the relationship between Neolithic stone quarrying and Bronze Age ore extraction. This may have involved the practical transfer and adoption of tools, ways of working, trade networks and 'markets' for the products and perhaps even personnel.

Such a model has been proposed for the connection between the Neolithic stone axe quarry of Graig Llwyd and the Great Orme Bronze Age copper mine. These two major production centres are situated in close geographical proximity on the coast of north Wales, UK.

In this paper, I re-examine the role that the Neolithic tradition of stone extraction and processing at nearby Graig Llwyd played in the inception and development of copper mining on the Great Orme during the second millennium cal BC. I argue that the jux-

taposition of the Bronze Age mine and the earlier Neolithic site is unlikely to have been a coincidence determined solely by raw material availability and the co-location of a related technology. Rather, I explore the ways in which this continuum of knowledge and activity concerned with the acquisition and use of available material resources created a conceptual context for copper mining on the Great Orme, both rationalising and validating ore extraction there.

9 TRANSFER OF TECHNOLOGY OR A TRANSFER OF INTEREST? THE SPONTANEOUS SEARCH FOR METAL ORES IN EARLY BRONZE AGE BRITAIN

Author(s): Timberlake, Simon (Early Mines Research Group)

Presentation Format: Oral

The evidence from the upland mineral-rich areas in the west of Britain where archaeological evidence has been found for Early Bronze Age primitive copper mining suggests that what we are mostly looking at is the phenomenon of ad hoc. prospecting by local inhabitants carried out using utilitarian un-modified cobble stone tools and firesetting upon small vein showings of copper minerals, rather than systematic mining campaigns undertaken by specialists. There is some development of basic mining technology to deal with problems of flooding for example, but this appears to be local, and not evidently transferred. Likewise no evidence has been found for the local smelting of ores; copper ore perhaps being traded for metal with metallurgists passing through these areas, the products of these mines thus ending up mixed and now difficult to recognize. Mining between 2000-1600BC may well have been a seasonal activity taking place in the summer months, and in many cases linked to the annual transhumance cycle of pastoralists.

10 POSSIBILITIES AND FIRST RESULTS OF RESEARCH ON PREHISTORIC COPPER MINING IN THE KACZAWSKIE MOUNTAINS AND IN THE KACZAWSKIE FOOTHILLS, POLAND

Author(s): Nowak, Kamil (Institute of Archaeology University of Wrocław) - Stolarczyk, Tomasz (Copper Museum in Legnica)

Presentation Format: Oral

The region of south-western Poland in the basin of the Kaczawa River belonged in the Bronze Age and early Iron Age to regions strongly associated with the foundry activity. The presence of shallow copper deposits, located in the Kaczawskie Mountains and in the Kaczawskie Foothills, could have an impact on the development of this area. The possibility of the functioning of metallurgical center in the Late Bronze Age and the Early Iron Age, located in the immediate vicinity of copper deposits, seems particularly important. A distinct grouping of finds related to the bronze casting (casting moulds) in the vicinity of today's Legnica could be a proof for the separation of such a center. Casting moulds were found in Bronze Age urnfields, e.g. in Piekary, in Mierczyce or in Legnica. In this area there are also casting workshops dating back to the Early Iron Age discovered on the settlements of the Lusatian culture in Grzybiany, Kunice and Myślubórz. The proximity of outcroppings of copper deposits in the Kaczawskie Mountains and in the Kaczawskie Foothills region, especially in the context of a considerably completed state of research on this issue in recent years, prompts us to look again at the possibility of local mining activities of copper deposits, which was often indicated in the literature. During the paper, current research results related to local copper processing will be presented, including preliminary results of the first excavation research in the mining area.

279 QUANTIFYING STONE AGE MOBILITY: SCALES AND PARAMETERS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Sobkowiak-Tabaka, Iwona (Institute of Archeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań) - Diachenko, Aleksandr (Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv) - Wiśniewski, Andrzej (Institute of Archaeology, University of Wrocław)

Format: Regular session

Hunter-gatherer populations are usually presented as opposed to Neolithic communities through the highly mobile way of life contrasting to sedentary system of occupation. Meanwhile, numerous case studies have shown that the 'mobile cliché' of hunters, gatherers and fishers is often far from ethnographic and archaeological reality. The same applies to an idealized picture of early farmers settled particular places for a long time. This session explores quantitative approaches to mobility from the Paleolithic to the Neolithic at different spatio-temporal scales.

We encourage archaeological and ethno-archaeological contributions dealing with modelling and quantitative approaches to various aspects of Stone Age mobility. The session will explore the following questions:

- what parameters can be used to describe different factors of movement?
- what is the correlation between parameters describing environmental diversity, demography and the values describing spatial movement?
- can we unify the definitions for different spatio-temporal scales?
- what factors can be indicated as those responsible for different dynamics of mobility?
- when and why the outcomes of studies conducted at different spatio-temporal scales contradict each other in terms of reconstruction of mobility?

Approaches to the not listed, but related issues are also highly welcome!

ABSTRACTS

1 PAST AND MODERN FUZZINESS: HOW TO FIND OUT MORE ABOUT FINAL PALAEO-LITHIC MOBILITY PATTERNS

Author(s): Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 "Scales of Transformation") - Knitter, Daniel (CRC 1266 "Scales of Transformation"; CAU Kiel, Institute of Geography, research group physical geography, landscape ecology, and geoinformation) - Hamer, Wolfgang (CRC 1266 "Scales of Transformation"; CAU Kiel, Institute of Geography, research group physical geography, landscape ecology, and geoinformation) - Serbe, Benjamin - Eriksen, Berit (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 "Scales of Transformation")

Presentation Format: Oral

The Final Palaeolithic record of northern Germany is relatively scarce and despite the famous Ahrensburg Tunnel Valley sites poor in organic preservation. On these few sites with good organic preservation, seasonal indicators suggest that hunter-gatherer groups were present there during the autumn season. Hence, a picture was occasionally developed of seasonal incursions into this landscape by hunter-gatherers. This picture is contrasted by the number and distribution of sites leaving the question of how we envisage the settlement patterns of these hunter-gatherers in the south-western Baltic region.

We approached this in three different chronological slices during the Weichselian Lateglacial in northern Germany: The Hamburgian period (GI-1e-d), the Federmesser-Gruppen/Brommean period (GI-1c-a), and the Ahrensburgian (GS-1). These three periods are also related with different stage in the environmental development and that may have a first influence on the preservation, identification, and distribution of the sites.

We fed our knowledge about the site distributions and the landscape into geospatial analyses using R to identify non-random parameters. Furthermore, we phrased hypotheses about the Final Palaeolithic settlement behaviour and tested them against our landscape models. Based on the different results, we developed fuzzy based scenarios for the mobility strategies of Final Palaeolithic hunter-gatherers. The archaeological interpretation of these mathematical results of geographic models explicitly show how our decisions and theoretical pre-conceptions as modern-day scientists influence the results. Hence, we should always be aware of these to prevent mis-guided interpretations of the past.

2 DECIPHERING SEASONAL SETTLEMENT STRATEGIES - A CASE STUDY FROM LATE UPPER PALAEO-LITHIC NORTHWESTERN EUROPE

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

Presentation Format: Oral

Settlement strategies are an important aspect of describing hunter-gatherer behaviour from an archaeological perspective. Important factors in analysing these strategies are site type/function and mobility. The determination of the site type/function derives most often from a combination of ethnographic, environmental, and material culture-based studies. The general mobility of hunter-gatherers is most often identified by the determination of lithic raw materials and their outcrops and, furthermore, on the origin of other mineral materials, such as amber, molluscs and shells.

Nonetheless, it should be underlined that the ultimate basis of any settlement pattern analysis are sites and their characterisation on spatial, temporal, function and social grounds. Here I present a study of sites from Paris basin, northern Germany and southern Scandinavia that bear the potential for a partial settlement system analysis, as they are only representatives of specified camps that are closely linked to reindeer hunting in autumn.

The study focusses on the spatio-temporal deciphering of the operational schemes related to the production of antler tools and weapons as well as the identification of social group structures. It furthermore adds data from other fields (lithic typology and technology, zooarchaeology etc.) and results in the identification of a dynamic autumnal settlement strategy. This points to a high flexibility and an equally high mobility of Late Upper Palaeolithic reindeer hunters in Northwestern Europe during the very short season of the autumnal reindeer migrations.

3 MOBILITY OF THE LAST HUNTER-GATHERERS IN THE SOUTH-WESTERN IBERIA: STRONTIUM-BASED APPROACH

Author(s): Peyroteo Stjerna, Rita (Human Evolution, Dep Organismal Biology, Uppsala University; UNIRQ, Centro de Arqueologia da Universidade de Lisboa) - Costa, Ana Maria (LARC, Laboratório de Arqueociências da DGPC; CIBIO/InBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos; IDL, Instituto Dom Luiz, Universidade de Lisboa) - Pokutta, Dalia (Archaeological Research Laboratory University of Stockholm) - Araújo, Ana Cristina (LARC, Laboratório de Arqueociências da DGPC; CIBIO/InBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos; UNIRQ, Centro de Arqueologia da Universidade de Lisboa)

Presentation Format: Oral

In archaeology it has been commonly accepted that the construction of the first cemeteries in Europe, between c.10000-8000 years ago, is an indicator of increasing sedentism of mobile hunter-gatherer groups, before the adoption of sedentary farming

lifestyles. However, this assumption is not always fully supported by hard data.

In this paper we explore the mobility of the hunter-gatherers buried in the Mesolithic cemeteries of the Tagus, Sado and Mira valleys, Portugal. These sites aggregate some of the largest and earliest burial grounds known, around 8000 years old, arranged and maintained by populations with an exclusive hunting, fishing, and foraging lifestyle. Our aim is to investigate behavioural processes in terms of the geographic origin and mobility history of the people buried in these sites, and how it may have depended on biological sex, age, kinship, and socio-cultural issues. To achieve this goal, we conducted stable isotope analyses of strontium (^{87}Sr and ^{86}Sr). Strontium isotope ratios reflect the local geology and its specific chemical signature varies accordingly. This geochemical marker is used in archaeology to trace migration and mobility patterns by examining the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio in bones and teeth, which are passed on to human tissues through drinking water.

We present the results of mapping variations in environmental $^{87}\text{Sr}/^{86}\text{Sr}$ (using Thermal Ionisation Mass Spectrometry) in the regions of influence of the discussed areas, i.e. the local and regional base-line. To correlate age-dependent tissue formation time with regional geochemical signatures we conducted a pilot study by micro-sampling tooth enamel and measuring $^{87}\text{Sr}/^{86}\text{Sr}$ isotopic ratio (using Laser Ablation ICP-MS) to quantify and characterize the mobility history of each individual.

4 **READING THE PAST MOBILITY OF LATE PALAEOLITHIC HUNTER-GATHERERS. THE CASE STUDY FROM SOWIN SITE COMPLEX, SW POLAND**

Author(s): Wisniewski, Andrzej (Institute of Archaeology, University of Wrocław) - Kozyra, Cyprian (Department of Statistics, Wrocław University of Economics) - Chłóń, Marcin (Institute of Archaeology, University of Wrocław)

Presentation Format: Oral

Reconstruction of late Palaeolithic human mobility is a complex issue. It depends not only on a given paradigm but also on data-set concerning human activity, chronology, and environmental contexts.

A goal of this presentation is to discuss the question of mobility during recolonization of an area located north of Sudetes and Carpathians after Late Glacial Maximum (LGM) using a case study from Sowin complex sites (SW Poland). In connection with this problem, using the same criterion we tried to answer the additional question whether there are differences between post LGM sites from Poland in respect of settlement dynamics.

To resolve this question correspondence analysis was performed. The correspondence analysis is a multivariate statistical technique based on the graphical representation of cross tabulations.

Our study leads to some conclusions. Firstly, it would seem that the variability of Sowin sites in terms of typological and functional features show homogeneity. It is also interesting that during testing of the variability of sites we did not find a correlation between mobility and cultural unit. This work has been financially supported by the National Centre of Science (no project UMO-2014/13/B/HS3/04906).

5 **APPROACHING LATE PALAEOLITHIC MOBILITY ON THE NORTH EUROPEAN PLAIN**

Author(s): Sobkowiak-Tabaka, Iwona (Institute of Archeology and Ethnology of the Polish Academy of Sciences, Centre for Prehistoric and Medieval Studies, Poznań) - Diachenko, Aleksandr (Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv)

Presentation Format: Oral

Poor preservation of organic remains at the Late Palaeolithic sites of the North European Plain makes the analysis of seasonal mobility of those populations complicated. Moreover, ethnographic data suggests very different models of spatial behavior, which are reflected in the related archaeological studies. Being in situation of rare evidence, i.e. representative collections of fauna and remains of plants etc., we are in need of the properly parametrized proxies.

This paper deals with the model linking the seasonal mobility, duration of camps occupation, intensiveness of activities at different scales, subsistence strategies of the population groups and sites location. Correlation between these parameters is measured through the correspondence analysis. Application of the model to Federmesser sites in the Eastern part of the North European Plain enables the conclusion on the decrease in mobility and significant shift in subsistence strategies of the Late Paleolithic populations in the area over time.

This research was made possible by a grant from the National Science Centre, Poland no. 2016/21/B/HS3/03134.

6 **USING LITHIC ARTEFACT DENSITY AS A TOOL FOR UNDERSTANDING HUNTER-GATHERERS MOBILITY SYSTEMS: THE CASE OF NESHER RAMLA UPPER SEQUENCE**

Author(s): Centi, Laura - Hovers, Erella - Zaidner, Yossi (Hebrew University of Jerusalem)

Presentation Format: Oral

The Middle Palaeolithic open-air site of Neshar Ramla is located in central Israel and yielded an eight-meter-thick archaeological sequence. Human occupations took place in situ within a karst depression. This study focuses on the lithic assemblages of the upper part of the Neshar Ramla sequence (Units I-II), where lithic technological organization and lithic artefact density show significant variations, possibly reflecting shifts in intensity of site use. The archaeological perception of site use intensity is a combined outcome of the frequency of human occupations at the site, the length of each occupational episode and the number of people present at the site. Site use intensity gives thus valuable information about mobility dynamics of past populations. In

this work, we analysed a number of proxies, among them composition of the lithic assemblages and the lithic artefact densities. The interplay between these proxies suggests that during the occupation of Unit II, phases of pronounced mobility alternate with phases when human groups were less mobile, although the site maintained the same role within the hunter-gatherers mobility system. In the later phases of human occupation of the site (Unit I), visits to the depression became more sporadic, and possibly shorter in nature, until the site eventually was abandoned. The recorded shifts in the role that Neshar Ramla played in past hunter-gatherers mobility systems might have been triggered by changes in the shape of the karst depression over time. Finally, a comparison with other Levantine Middle Palaeolithic sites suggest that even in the phases of more intense occupation, Neshar Ramla Upper sequence was never used as a base camp, but rather its role shifted from short term camp to ephemeral camp.

7 MOVING STONES, PEOPLE AND IDEAS: ETHNOARCHAEOLOGICAL STUDIES ON SMALL-SCALE MOBILITY IN SUMBA, INDONESIA

Author(s): Wunderlich, Maria (Institute of Pre- and Protohistoric Archaeology, University Kiel)

Presentation Format: Oral

The identification, analysis and interpretation of mobility within prehistoric contexts must be seen as a fundamental topic which was most probably influenced by different societal aspects, such as economic, social or ideological factors. A great help for an understanding of potential triggers and reasons of mobility on different scales can be found within anthropological contexts. The integration of anthropological and ethnoarchaeological data enable archaeologist to think outside the box, to gain understanding of different forms of mobility, as well as potential markers of mobility within the wide frame of material culture.

These questions will be addressed in my talk with a focus on the island of Sumba within the Indonesian archipelago. Mostly known for the continuous erection of megalithic monuments, the case study of societies on Sumba also provide an outstanding example of communities which are highly favorable of mobility in different forms. This includes the mobility of related individuals between different villages for gathering and feasting events, as well as movements of ideas and symbolism. Further, short-term mobility is strongly connected to the erection of megalithic monuments.

The example of Sumba offers insights to different driving factors of small-scale and sometimes day-to-day mobility within a naturally restricted environment. These factors can be identified within communal and competitive spheres and are constituted by kinship-systems and cooperative needs within farming communities. The movements of people and ideas are expressed through central gathering places, feasting activities and manifest themselves through a shared symbolism on megalithic tombs and houses. These intensely interwoven aspects are the foundation of the connection between diverse exchange systems and day-to-day mobility, thus being of high interest for archaeological questions.

8 PERCEPTION AND MIGRATION: PREHISTORIC STUDIES

Author(s): Zubrow, Ezra (University at Buffalo; University at Toronto) - Leavitt, Jay (University at Buffalo) - Diachenko, Oleksandr (Institute of Archaeology)

Presentation Format: Oral

This paper considers the role of perception in prehistoric migratory decisions. It is part of a series of papers that the authors are writing on a general theory of migration and its application to prehistory.

Migratory decisions are examined from both the individual (agency) and aggregate level. Migratory decisions are considered from the perspective of the migrant (individual) and the migrant group (population); from the perspective of individuals and the community from which emigration takes place; and from the perspective of the individual and the community to which the immigrant moves.

Temporally, these perceptions may be different prior to; during; and after the migration events take place.

A simulation model has been developed and has been tested with a limited number of assumptions regarding the number of locations, migratory events, and interactions among the communities and the migrants. It has been tested using prehistoric data from Cucuteni-Trypillia settlements dated 3600 to 3700 BC.

9 SPATIAL ANALYSIS OF OBJECTS ATTRIBUTED TO THE MEZHYRICHIAN EPIGRAVETTIAN CULTURE: A MODEL OF MOBILITY

Author(s): Shydlovskiy, Pavlo (Taras Shevchenko National University of Kyiv) - Tsvirkun, Ostap (Institute of Archaeology NAS of Ukraine) - Péan, Stéphane (UMR 7194 HNHP, MNHN/CNRS/UPVD, Muséum national d'histoire naturelle, Paris)

Presentation Format: Oral

In the basin of the Middle Dnieper and its tributaries, a large number of Upper Palaeolithic sites and palaeontological deposits have been uncovered. The archaeological settlements are attributed to various chrono-cultural facies: Gravettian, Epigravettian, and Final Palaeolithic. A part of Epigravettian vestiges refers to the Mezhyrichian type of industry and is dated to the rather narrow limited time span of 15,1 – 14,3 14C uncal Kyr BP. The conducted typological-technological analysis of lithic assemblages allows us to assert the unity of processing techniques within this type. Such technological, territorial and chronological unity of sites represent the remnants of one society. These objects have different functional and seasonal characteristics, which create a unique opportunity to reconstruct certain aspects of life, seasonal mobility cycle, hunting strategy of a group in a common ecological niche. The base camps were mainly settled during the cold season, while in the warm season there was a more high

activity associated with topographically higher relief areas. The logistic model of annual mobility implies the presence of base camps in the center of the movement of the group, on the one hand and short-term camps, kill-sites, gathering of flintstone places on the other.

Planigraphic features of the settlement structures indicate a sectoral use of residential areas. The center of each one is a mammoth bone dwelling structure, around which there are functionally distinct objects and areas. The design of the dwellings exhibits a rhythmed and symmetrical disposal of bones in the structure. The renewal of internal space investigation inside the preserved fourth dwelling of Mezhyrich tends to confirm a sectoral location of functionally defined areas. The spatial distribution of sites and objects indicates the presence of a centralized structure of behaviour, which manifests itself at different hierarchical levels: dwelling, residential assemblage, base camp and subsistence territory.

10 A HOUSE NEAR THE RIVER, MESOLITHIC LAND USE AND A RARE DWELLING STRUCTURE FROM THE NETHERLANDS

Author(s): Muller, Axel (ADC archeoprojecten)

Presentation Format: Oral

The Dutch Mesolithic is often characterized by dense spatial patterns of flint artefacts. These patterns can represent one or more occupation events. Therefore large concentrations of flint artefacts are often interpreted as the results of serial occupations in a particular location. These locations are often situated in areas where different types of landscapes are in close proximity of each other. These specific landscapes have typical ecological characteristics, such as dense forests, open water, shrub lands, which could be exploited for different purposes. Sometimes it is even possible to determine in which season specific landscapes were used.

In the last decade theories of Mesolithic land use are often the basis for predictive modeling of site location and interpretive frameworks for early prehistoric sites. Recent excavations on the levees on the Dutch Palaeo-IJssel river system have yielded evidence for a relatively large Mesolithic dwelling structure, the first one in the Netherlands. We see evidence for substantial effort that was put into the construction of the hut. This can give new insights in the formation of Mesolithic sites and the level of mobility of these hunter-gatherers.

In this presentation we will discuss how we quantified Mesolithic land use, how we determined seasonal habitation and why new evidence of early house-like structures can change our interpretation of mesolithic settlement systems.

11 MAPPING POLISHED STONES : METADOLERITE AXES AND ADZES FROM THE ARMORICAN MASSIF

Author(s): Beneteaud, Lucie (pHd student, UMR 6566 CReAAH, Université Rennes 1)

Presentation Format: Oral

Prehistorians try to respond questions about the supply of raw materials, the shaping of the tools, the presence of different types of tools and furthermore the way in which these artefacts participate in the life of Neolithic societies. In the case of artefacts like polished stones, we also discuss the variations of the morphology and the types in relation to their functions and the environment they are used.

Thanks to eighty years of studies, a great many polished stones from the Armorican Massif have been collected and analysed. The first relational database dedicated to these axes and adzes was created in 2016, as part of a doctoral thesis. Nearly four thousands of tools have been inventoried so far.

From all the artefacts registred, we have produce statistics that allow us for further fine-tuning typological features ever known. As well, we have been able to do chemical analysis, by X-ray fluorescence (XRF) notably, in order to identify the raw material sources.

Linked to a geographical information system (GIS), we are now able to produce a precise cartography of the metadolerite polished stones from western France. The maps, which show a very large use and diffusion of the axes and adzes, help us to understand Neolithic communities and their choices.

12 DETERMINATION OF LITHIC RAW MATERIALS AND SUPPLY STRATEGIES IN THE SELLA VALLEY: TITO BUSTILLO (RIBADESELLA, ASTURIAS, SPAIN)

Author(s): Martín Jarque, Sergio (Universidad de Salamanca) - Tarriño, Antonio (Centro Nacional de Investigación sobre la Evolución Humana) - Bécares, Julián - Álvarez-Fernández, Esteban (Universidad de Salamanca)

Presentation Format: Oral

The Tito Bustillo Cave (Ribadesella, Asturias) is located at the mouth of the Sella River. It was discovered in 1968, the year in which paintings and engravings from the Paleolithic era were found. In 1970 M. A. García Guinea carried out the first excavations in the so-called Conjunto XI, close to what at that time was considered the old entrance of the cave, today blocked by a detachment. This area, now known as Área de Estancia, was excavated by J. A. Moure between 1972 and 1986. The results of the investigations brought to light one of the most important Magdalenian sites in the Cantabrian Spain, which documented abundant faunal remains, lithic and bone industry, portable art, etc. This paper presents the first results of the analysis of lithic raw materials in general and flint in particular of layer 1c2, assigned to the Lower Magdalenian (ca. 18,000 cal BP). The classification of the lithic pieces has been based on their external textural characters, for which we have used a reference collection. For the

determination of flint, a comprehensive petrographic analysis of the lithological group was carried out through a binocular loupe and the selection of samples for its study by means of thin films and X-ray diffraction (XRD). The objective is to know what geological formations could have been supplied by the hunter-gatherer groups that inhabited Tito Bustillo, reconstruct their spatial mobility and determine the patterns of transformation and use of flint during the Magdalenian. The first results indicate that, in addition to the presence of autochthonous lithologies of the Sella Valley such as quartzite, radiolarite or so-called black chert, in layer 1c2 predominate different types of flint, both from the western and central Cantabrian (Piloña, Monte Picota) as coming from the Spanish and French eastern Cantabrian (Flysch, Chalosse).

280 NEW APPROACHES IN BIOARCHAEOLOGY

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA, Los Angeles) - Rannamäe, Eve (BioArCh, Department of Archaeology, University of York; Department of Archaeology, Institute of History and Archaeology, University of Tartu) - Petaros, Anja (Department of Forensic Medicine, National Board of Forensic Medicine, Sweden)

Format: Regular session

Technical advances in the last decades have provided bioarchaeologists with numerous new techniques for analysis of skeletal remains and other bioarchaeological material. This includes analysis of biomolecules such as proteins, DNA, and hormones, stable isotopes and trace elements, 3D-scanning, and other digital morphometrics approaches. While such techniques increase the scope of archaeological information that can be obtained from bioarchaeological samples, they are not unproblematic and have limitations. They can be misused for sensational research or to hype a technique without providing useful archaeological knowledge. Methods such as DNA sequencing and 3D modelling generate large data sets, which creates problems in terms of data storing, sharing, and standardization, but also provides new research avenues by allowing big data analysis.

In this session we welcome all kinds of papers on bioarchaeological analysis employing “new” technologies or a multidisciplinary approach, regardless of geographic region or time period. As we do not necessarily believe that “new” equals “better”, however, we also welcome papers employing “old-fashioned” approaches to bioarchaeology, especially when the author(s) can show why the “old-fashioned” method still remains relevant, difficult to replace, or can be combined with “new” techniques. We particularly welcome papers discussing the scopes and limits of new bioarchaeological methods in relation to fundamental archaeological questions, and papers that aim to bridge the gap between archaeologists with and without a background in the natural sciences.

ABSTRACTS

1 SCIENTIFIC ANALYSIS OF BONES AND OBJECTS FROM THE VIKING AGE SITE OF HRÍSBRÚ, ICELAND

Author(s): Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA)

Presentation Format: Oral

At the Hrísbú site, located in the Mosfell valley just a few kilometers outside Iceland's capital Reykjavik, the Mosfell Archaeological Project has excavated a 10th-11th century farmstead including a traditional Viking Age longhouse, a farm church with an associated cemetery, and a pagan cremation site. At the cemetery and the cremation site human remains in varying degrees of preservation have been unearthed, while in the longhouse a rich material record has been uncovered consisting of e.g. lithic tools, glass beads, animal bones, and occasional metal items such as knives, nails, and keys. In my doctoral research I am using bioarchaeological, archaeometallurgical, and conservation science techniques to analyze this material, in order to better understand the history, living conditions, level of technology, and trade interactions of the inhabitants of the Hrísbú farmstead. Some comparisons with historic written documents are made. This paper presents a first round of results from the ongoing research.

2 ANALYSIS OF CELLULOSIC WRITING AND GRAPHIC ARTS SUBSTRATES VIA RESONANT CAVITY DIELECTRIC SPECTROSCOPY

Author(s): Kombolias, Mary (United States Government Publishing Office, Washington; National Institute of Standards and Technology, Gaithersburg) - Obrzut, Jan - Postek, Michael - Poster, Dianne - Obeng, Yaw (National Institute of Standards and Technology, Gaithersburg)

Presentation Format: Oral

Traditional means of analyzing the chemical composition of writing and graphic arts substrates result in mutilation, degradation, or destruction of some part of the specimen under investigation. Because the integrity of the substrate is threatened by repeated analysis, the size of the data sets collected are automatically restricted, thereby limiting their statistical relevance. We propose the use of dielectric spectroscopy as a means to overcome these limitations in the analysis of unique and rare writing and graphic arts substrates of historical and cultural value. Dielectric spectroscopy is a powerful analytical tool which utilizes the response of individual molecules to microwaves to elicit both chemical and structural information simultaneously. It has already been used to study modern day materials, such as semi-conductor devices and mono- and multilayer graphene nanomaterials. We have adapted dielectric spectroscopy with the use of a resonant cavity to enable contactless, non-destructive, quantitative measurements of printing and graphic arts substrates. Measurements can be performed in minutes and do not require special-

ized training, and our technique is easily automated and amenable to statistical process control. Furthermore, results can be encoded with appropriate data descriptors for inverse analysis via Artificial Neural Networks computational techniques from which selective calibration models can be built. This makes the entire analysis easier and more reliable and calibration models can be built to accommodate specific writing and graphic arts substrates. In this talk, we demonstrate how the resonant cavity-based technique can distinguish between papers of different compositions and also between the relative ages of papers of the same fiber composition.

3 **OSTEOBIOGRAPHY AND DIGITAL MICROSCOPY. APPROACHING MANIPULATED HUMAN REMAINS**

Author(s): Gramsch, Alexander (RGK - Romano-Germanic Commission DAI) - Grosskopf, Birgit (Historische Anthropologie, Universität Göttingen)

Presentation Format: Oral

The increase in technology-based approaches to the study of human remains solidified the perception of the human body as a repository of a wide array of data. Human remains are considered as a 'bio-archive' yielding information on age and sex, nutrition and health status, ancestry and individual or group mobility etc., leading to narratives of e.g. social inequality or migration. As the session organisers point out, numerous new digital approaches to skeletal remains increase the scope of bioarchaeological information, but at the same time methods and data and the resulting interpretations require critical discussion.

Recent years simultaneously witnessed the rising differentiation of interpretive approaches to the human body and both its material and sociocultural aspects. Bioarchaeology and thanatoarchaeology develop an understanding of the body as embodying strategies of coping with disease and death, and of the necessity to reconstruct individual biographies – osteobiography as a 'material history' written on the bones of individuals.

We are trying to merge both attitudes in an interdisciplinary small-scale project combining the approaches of osteobiography and thanatoarchaeology with the osteology/anthropology of human remains based upon digital data. In this project based at the Romano-Germanic Commission, Frankfurt a.M., in cooperation with the department of Historical Anthropology, Göttingen University, we are currently investigating human bones bearing traces of post-mortem manipulations, recovered from the Neolithic settlement site of Herxheim (Rhineland-Palatinate, Germany). The bones are examined using a digital microscope and applying digital photographic images at various resolutions, cross-sections, and 3D-modelling.

Using a praxeological concept we evaluate these data as traces of post-mortem practices manipulating the individual human body (and parts thereof). We suggest approaching the material history of the human body as an 'itinerary', describing how the body acted and was acted upon – both during the person's lifetime and following biological death, i.e. including post-mortem practices.

4 **DEATH ARCHAEOLOGY AND IT APPROACHES OF CAILAR'S GALLIC SEVERED HEADS: FINDINGS AND FEEDBACK ON NEW METHODOLOGY CREATE FOR**

Author(s): Ciesielski, Elsa (UMR 5140 - ASM : Archéologies des Sociétés Méditerranéennes)

Presentation Format: Oral

For more than a century now, severed heads have largely been evinced by stone carvings and human remains in southern France, but a new exceptional discovery (2003) allowed us to use recent and accurate methods from the excavation to the advanced analysis of the human remains.

These bones form a corpus quite different from the remains generally associated to collective burials or special treatments like embalming/comsumption (exclusively cranial, very fragmented, numerous, commingled and dispersed in several levels during a century). In order to understand the events that led to the creation of this assemblage, a special recording tool, combining "old-fashioned" methods, database and GIS was created to optimize the study. Not only for the spatial distribution analyse, but also to facilitate the quantification and the statistic study of the traces and fractures.

For that, the work was conduct with the idea that we do not know if spatial analysis methods provided by other research fields (e. g. geography or ecology) and software were consistent with our study's object. Also, after extensive research, it appears, for example, it is sometimes better to work with language R (especially for 3D distribution) rather than with the tools provided by some GIS software. It also appears that the recording tool created was very useful and accurate to study quantification and cut marks and fractures patterns, still combining "old-fashioned" methods, R language and GIS.

Ultimately, with the trace elements analyse, and soon with DNA and isotope anylysis, this work allows us to propose solid hypotheses regarding the process by which these heads were produced (i. e. means of recuperation, treatment, disposal, and deposition). This work also suggests which avenues of research will or will not be useful to pursue in future projects of a similar nature.

5 **NEW DIMENSIONS: EXPLORING THE POTENTIAL OF PHOTOGRAMMETRIC MODELLING TO ENHANCE SKELETAL TRAUMA ANALYSIS**

Author(s): Tamminen, Heather (Bournemouth University)

Presentation Format: Oral

With the continued development of technology, doors are opening to the use of digital methods for archaeological analysis, especially in regards to human remains. Multi-View Stereo Structure from Motion (MVS-SfM) photogrammetry is a fast, cheap, and

relatively easy way to create 3D models using overlapping images produced from multiple angles around a stationary object and is currently underexploited in osteological research and curation. For studies of skeletal trauma MVS-SfM can potentially provide advantages in accuracy, precision, and repeatability over conventional physical measurements or those taken from 2D photographs. Whilst laser scanning and digital microscopy can also create 3D models, they are relatively expensive and time consuming. What is less clear, however, are the influences of the geometry of image capture, camera parameters, and photogrammetric variables on the quality of measurements from MVS-SfM. Therefore, this paper presents initial results illustrating how best to apply photogrammetry for the creation of detailed 3D models of sharp force trauma on human remains. The technique also has the potential to create precise and accurate close-range models of other subject matter and therefore may present an invaluable resource for digitising, preserving, and studying more detailed aspects of preserved human remains. It ultimately offers a straightforward tool to record, analyse, and present traumatic defects to a variety of audiences, as required in order to study, share, and present such data.

6 KNOWLEDGE DISCOVERY IN DATABASES (KDD) REVEALS NEW INSIGHTS INTO MULTI-ISOTOPE DATA

Author(s): Göhring, Andrea (Ludwig Maximilian University Munich, Faculty of Biology, Anthropology and Human Genomics) - Mauder, Markus - Kröger, Peer (Ludwig Maximilian University Munich, Faculty of Mathematics, Computer Science and Statistics, Database Systems Group) - Grupe, Gisela (Ludwig Maximilian University Munich, Faculty of Biology, Anthropology and Human Genomics)

Presentation Format: Oral

Knowledge Discovery in Databases (KDD) describes the process of gaining knowledge from a data set including Data Mining techniques (e. g. cluster analysis, feature ranking). KDD can be applied on multi-isotope data sets and reveals new information on specific questions, such as habitat choice or import. The huge multi-isotope data set from Viking Haithabu and medieval Schleswig in northern Germany allows for the application of KDD. Due to the location close to the Baltic sea a complex ecosystem is reflected by the isotopic signature, which cannot be discovered in total using common bivariate isotope analyses. However, i. e. cluster analysis using a Gaussian Mixture Model (GMM) is able to reveal new information. Furthermore, KDD can help to select certain isotopic systems containing more information than others for answering specific questions. This can be helpful if only few material is available, which is often the case in archaeological contexts. However, when material is limited (i. e. archaeological remains) it is obligatory to decide a priori which isotopic system(s) could be omitted from extraction without losing information. Feature ranking techniques allow to choose the most informative isotopic systems, depending on the research question to be answered

7 BABES, BONES AND ISOTOPES: BIOARCHAEOLOGICAL AND ISOTOPIC INVESTIGATION OF HEALTH AND INFANT FEEDING PRACTICES IN AVENTICUM, SWITZERLAND (1ST-3RD C. AD)

Author(s): Bourbou, Chryssi (University of Fribourg; Hellenic Ministry of Culture) - Lösch, Sandra (University of Bern) - Dasen, Véronique (University of Fribourg)

Presentation Format: Oral

The study of perinatal skeletal remains from archaeological populations adds considerably to the research about the lives of mothers and their babies in the past. Pathological and age-at-death information in conjunction with stable isotopes analysis ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values) can aid in understanding of cultural attitudes towards dietary choices and how specific circumstances experienced by mothers and their offspring influences childhood health and survivorship. This paper presents the bioarchaeological and stable isotopic analysis of a non-adult sample from Aventicum/Avenches, the civitas capital of the territory of Helvetii during the Roman period (1st-3rd c. AD). The obtained data offer an unprecedented insight into childhood mortality, disease and infant feeding practices in Roman Switzerland, adding to the discussion regarding living conditions in the urban centers at the periphery of the Roman Empire. It also highlights the complexity behind the interpretation of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values, as different factors, including natural variation of fetal and maternal stable isotope values, the possible effects of intrauterine growth, as well as maternal/fetal disease stress (e.g. nutritional deficiencies such as scurvy, parasitic infections, such as malaria), can influence the obtained isotopic data.

8 YOU ARE WHAT YOU EAT: ISOTOPIC MIXING MODELS APPLIED TO DATA FROM NEOLITHIC EUROPE

Author(s): Sebald, Sidney (Ludwig Maximilian University) - Papathanasiou, Anastasia (Greek Ministry of Culture) - Richards, Michael (Simon Fraser University) - Grupe, Gisela (Ludwig Maximilian University)

Presentation Format: Oral

Collagen stable isotopes ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) in archaeological human bones are commonly used to assess the trophic level ($\delta^{15}\text{N}$) and the vegetal food source (C3-plants vs. C4-plants, marine vs. terrestrial; $\delta^{13}\text{C}$). The results of isotopic analysis are usually interpreted by bivariate plots and univariate statistics. However, an isotopic sourcing reveals much more information about the biomass contribution of selected food sources.

Since it is assumed that the Neolithic Transition was accompanied by dietary change, stable isotopic ratios of human and animal bones from Neolithic sites are especially attractive for an in-depth diet reconstruction. Indeed, the Neolithic was a time of extensive transformation. The Neolithic Transition started in the Fertile Crescent and came to Europe at around 6800 BC, starting in Greece and from there on expanding to the Balkan. Previously published isotopic data were re-interpreted by use of concentra-

tion-dependent mixing models provided by IsoConc and SISUS.

For the reconstruction of palaeodiet, the Neolithic Greek sites Alepotrypa, Franchthi, Mavropigi, Theopetra and Xirolimni and the Meso/Neolithic Serbian sites Lepinski Vir and Vlasac were examined. These sites are characterized by different environmental parameters, leading to different resources. While Greece with its Mediterranean climate and environment provides a C3-plant based diet augmented by animal protein like meat and marine fish, the Serbian sites have access to the Danube and exploited freshwater resources.

While the largely freshwater diet of the humans from the Serbian sites was confirmed, new staples became visible in the later Greek populations indicative of changing subsistence economies.

9 WHAT CAN DIET REVEAL? AN ISOTOPIC INVESTIGATION OF LEPROSY SUFFERERS FROM MEDIEVAL DENMARK

Author(s): Brozou, Anastasia - Fuller, Benjamin (Department of Archaeology and Heritage Studies, Aarhus University) - Lynnerup, Niels (Department of Forensic Medicine, University of Copenhagen) - Boldsen, Jesper (Department of Forensic Medicine, University of Southern Denmark) - Jørkov, Marie Louise (Department of Forensic Medicine, University of Copenhagen) - Dangvard Pedersen, Dorthe (Department of Forensic Medicine, University of Southern Denmark) - Olsen, Jesper (Department of Physics and Astronomy, Aarhus University) - Mannino, Marcello (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

Leprosy is an infectious disease that may lead to blindness, muscle paralysis and disfigurement, and, as a result, to stigmatisation. The disease was common in Europe during the medieval period, when numerous leprosy hospitals (leprosaria) were established. Leprosaria were monastic institutions, and their purpose (isolation or nursing) has been a debatable subject for historians. Seen from a present-day perspective, leprosy hospitals – having been established during a period when the notion of contagion had not yet been comprehended – do provide an awareness of medieval attitudes towards diseases and social relations. The aim of the present paper is to investigate the medieval perception of leprosy and leprosy sufferers by using diet in leprosaria as a proxy. When dealing with the issue of stigma attached to a disease, it is important to reconstruct individual diets. With the objective of improving our knowledge on how the disease affected institutionalised individuals, as well as medieval society as a whole, we have conducted an isotopic investigation (carbon and nitrogen stable isotopes) and explored the diet of leprosy sufferers from medieval Danish leprosaria, by also taking into consideration relevant historical information. A further aim is to investigate the organisational structure of these institutions by revealing, for example, distinctions between sex, age and social groups, as well as dietary differentiations with local, contemporary communities.

10 REBELS OR MERCENARIES? A MULTI-ISOTOPIC INVESTIGATION OF A LATE MEDIEVAL MASS GRAVE FROM AALBORG (DENMARK)

Author(s): Mannino, Marcello (Department of Archaeology and Heritage Studies, Aarhus University; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Østergaard, Susanne (Moesgaard Museum) - Kanstrup, Marie (Department of Physics and Astronomy, Aarhus University) - Talamo, Sahra (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Enggaard Jørgensen, Eva Karina (Department of Archaeology and Heritage Studies, Aarhus University) - Bergmann Møller, Stig - Springborg, Bente (Nordjyllands Historiske Museum, Aalborg) - Olsen, Jesper (Department of Physics and Astronomy, Aarhus University) - Lynnerup, Niels - Schjellerup Jørkov, Marie Louise (Department of Forensic Medicine, University of Copenhagen)

Presentation Format: Oral

In 2015 the Nordjyllands Historiske Museum explored the cemetery of the former Church of Saint Peter in Aalborg at Tiendeladen. This excavation unearthed 33 ordinary burials, as well as a Late Medieval mass grave containing 18 individuals. The osteological study revealed that the skeletons belonged almost exclusively to men subjected to high levels of perimortem trauma from sharp weapons. It was, thus, hypothesized that this mass grave was dug to deal with the death toll resulting from the incursion by the troops of King Christian III that took place in December 1534, during the conflict known as the Count's Feud. To determine if this was indeed the case, human bone collagen has been AMS radiocarbon dated. Here we present the results of the carbon and nitrogen isotope analyses on individuals from the mass grave and from ordinary inhumations at the churchyard, to start evaluating whether the victims were local civilian rebels or foreign mercenaries. The skeletons from the mass grave have isotopic ratios that overlap with those of the ordinarily inhumated people, suggesting that the diets of all those buried around Saint Peter's church were based mainly on terrestrial foods and included significant amounts of animal protein, around a fifth of which originating from fish (e.g. herring). This dietary mix is different from that of other Late Medieval north European populations and compatible with Aalborg's monopoly on the Limfjord herring fishery. Ongoing isotope analyses on bone collagen (hydrogen and sulphur), along with planned oxygen and strontium isotope analyses on dental enamel, will likely solve the question.

11 REVEALING MOBILITY PATTERNS IN EARLY MEDIEVAL NORTHEASTERN ITALY THROUGH STRONTIUM ISOTOPE ANALYSIS: A PRELIMINARY REPORT

Author(s): Vianello, Andrea - Tykot, Robert (University of South Florida)

Presentation Format: Oral

In northeastern Italy, the area between Ferrara and Ravenna was particularly important in Late Antiquity, with Ravenna serving as capital of the Empires and Kingdoms that controlled the region between the fourth and eighth centuries AD. The study of a series of fortuitous findings of skeletal material was done in an area in which migration and mobility was probably significant, but poorly documented. The research is targeted on one hundred individuals from the area north of Ravenna, dating mostly to the sixth and seventh centuries AD, towards the corridors that brought Barbarian populations into the Italian peninsula. Strontium isotope analysis by multi-collector ICP mass spectrometry is used to determine both the approximate percentage of individuals not born in the area, whether there is a pattern based on sex, and how many different geological areas are represented among the non-locals. For the latter purpose, we use a database of existing analyses of animals and soils, as well as our analyses of local water and plants for comparison.

The combination of strontium isotopes with oxygen isotopes for some individuals strengthens our ability to provide data revealing some patterns. The statistical sampling of small cemeteries across a broader area instead of sampling individuals at one site is also valuable in providing a more robust perspective of mobility in the region during the early Medieval period. It is likely that officials and soldiers based in Ravenna itself would affect the burial composition of urban cemeteries, while smaller and sparser cemeteries, often overlooked, provide a view of the composition of the larger society and the impact of the sociopolitical situation in the region. The use of sparse sites also produces greater challenges when using strontium and oxygen isotopes analyses, since more variability within and among sites is to be expected.

12 ISOTOPE ANALYSIS OF HUMAN DENTAL CALCULUS CARBONATE: INVESTIGATING A POTENTIAL NEW PROXY FOR SUGAR CONSUMPTION

Author(s): Chidimuro, Blessing - Alexander, Michelle (BioArCh, Department of Archaeology, University of York) - Collins, Matthew (BioArCh, Department of Archaeology, University of York; Natural History Museum, University of Copenhagen; Department of Archaeology, University of Cambridge) - Speller, Camilla (BioArCh, Department of Archaeology, University of York; Department of Anthropology, University of British Columbia) - Lamb, Angela (NERC Isotope Geosciences Facility, British Geological Survey, Keyworth)

Presentation Format: Oral

The current understanding of dietary composition in palaeodietary studies is mainly based on stable isotope analysis of bone collagen ($\delta^{13}C$, $\delta^{15}N$) and bone carbonate ($\delta^{13}C$). In areas where plants adapted to warm and dry climates (C_4 based-plants) are present, their consumption and the consumption of animals feeding on them can be differentiated from the reliance on plants adapted to temperate regions (C_3 plant-based) using stable isotopes of bone carbonate. This application has proved immensely useful in many areas of the world, for instance, for tracking the introduction of maize (C_4) agriculture in the Americas but has so far only been limited use in European Archaeology where plants are almost exclusively C_3 . However, historical documents and an increase in the prevalence of dental caries in the 18th century suggest an increase in the intake of sugarcane (a C_4 carbohydrate) in England. The increased intake of refined sugars has been linked to myriad health problems in industrialised England. Sugar is a key element of cuisine but not always a dominant component of the diet, and thus may not be visible through the isotopic analysis of bulk collagen or bone carbonate. Dental calculus, however, may offer a novel way of directly identifying sugar consumption in past populations.

In this paper, we present bone, enamel and dental calculus mineral ($\delta^{13}C$) and collagen isotope ($\delta^{13}C$, $\delta^{15}N$) results from samples from modern humans from the University of Tennessee FAC of individuals who will have consumed a diet known to include C_4 foods and medieval English individuals who had no C_4 in their diet. We present the different ranges of $\delta^{13}C$ values for calculus and offsets with bone carbonate and molar enamel $\delta^{13}C$ in these populations and reveal the validity of using dental calculus carbonate as a new proxy for sugar consumption.

13 ANCIENT RETROVIRUSES IN AID OF DISCOVERING AND CONSERVING ABORIGINAL SHEEP LINEAGES

Author(s): Rannamäe, Eve (BioArCh, Department of Archaeology, University of York; Department of Archaeology, Institute of History and Archaeology, University of Tartu) - Saarma, Urmas (Department of Zoology, Institute of Ecology and Earth Sciences, University of Tartu) - Ärmpalu-Idvand, Anneli (Kihnu Native Sheep Society) - Teasdale, Matthew (BioArch, Department of Archaeology, University of York) - Speller, Camilla (Department of Anthropology, University of British Columbia)

Presentation Format: Oral

In Estonia, both genetic and osteological data indicate that sheep husbandry has been consistently an important source of subsistence in the last three thousand years. Today, sheep farming in Estonia is rather small-scale and economically of minor importance. However, there is growing interest in native sheep, partly because of their products, but native sheep provide also a valuable source for conserving genetic diversity and improving modern breeds. This trend has provoked questions about the origin of aboriginal sheep – the Kihnu native sheep breed – and their connections with ancient populations. We have used the analysis of endogenous retroviruses in the genomes of ancient and modern sheep from north-eastern Europe to reveal whether the studied individuals have affinities with the “primitive” northern European breeds or belong to a later migratory episode

involving sheep with improved production traits [sensu Chessa et al. Science 324, 532 (2009)]. The method is based on the amplification of short genomic fragments, using the well-known Polymerase Chain Reaction (PCR), and on the available data about retroviral integrations in domestic sheep. However, this is the first time when this method has been applied on Estonian aboriginal sheep and on ancient sheep populations of north-eastern Europe. While the results on ancient samples elucidate the history and development of local sheep populations, the analysis on extant aboriginal sheep revealed individuals with primitive retotypes, suggesting that the origin of Kihnu native sheep is ancient and they belong to the first wave that brought “primitive” sheep to Europe. Such primitive sheep lineages currently exist only in the peripheral areas of Europe. The results are useful in finding and conserving the most aboriginal lineages among the Kihnu native sheep and helping to envisage breeding strategies.

14 ANCIENT MITOCHONDRIAL DNA ANALYSIS OF RING-NECKED PHEASANT (*PHASIANUS COLCHICUS*) BONES COLLECTED FROM 4TH CENTURY ARCHAEOLOGICAL SITE IN SOUTH KOREA

Author(s): Hong, Jong Ha - Oh, Chang Seok (Lab of Bioanthropology Paleopathology and History of Disease, Department of Anatomy and Cell Biology / Institute of Forensic Science, Seoul National University College of Medicine, Seoul) - Kim, Hwan-il (Central Institute of Cultural Heritage, Seongnam-si, Gyeonggi-do) - Woo, Eun Jin (Department of History, Sejong University, Seoul) - Cho, Tae sop (Department of History, Yonsei University, Seoul) - Shin, Dong Hoon (Lab of Bioanthropology Paleopathology and History of Disease, Department of Anatomy and Cell Biology / Institute of Forensic Science, Seoul National University College of Medicine, Seoul)

Presentation Format: Oral

Ancient DNA (aDNA) analysis becomes widely used nowadays to get genetic information from the ancient avian bones discovered at archaeological sites. However, as for Ring-necked Pheasants (*Phasianus colchicus*), though it was closely related to human culture and society for a long time, detailed genetic history could not be inferred from aDNA analysis. In this study, we thus carried out the first research on the ancient *P. colchicus* DNA recovered from 4th century avian bones found in South Korea. We used femurs of two avian individuals (K-14 and K-15) for amplification, cloning and sequencing of *P. colchicus* aDNA. In NCBI/BLAST search, the haplotypes of the current ancient pheasants (K-14 and K-15) were similar to modern *P. colchicus* DNAs (*P. c. pallasi*, *P. c. strauchii*, *P. c. elegans*, *P. c. torqualus*, *P. c. kengsuensis* and *P. c. karpowi* etc.) that belong to the Eastern clade of Ring-necked Pheasant subspecies. The ancient pheasant DNAs (K-14 and K-15) obtained in the current study were the genetically closest to *P. c. pallasi*, the subspecies commonly found in Manchuria and Korean peninsula. Through this analysis, we managed to reveal fundamental genetic traits of the ancient Ring-necked Pheasants existed long ago in East Asia, thus providing fundamental phylogeographical information of *P. colchicus* DNA across time and space. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2017R1D1A1B03030127). For any queries about this presentation, please contact DHS (cuteminjae@gmail.com).

15 GENETIC EXPLORATION OF THE ORIGINS OF THE SOLDIERS AT HIMERA, SICILY

Author(s): Mittnik, Alissa (Department of Genetics, Harvard Medical School) - Reitsema, Laurie (Department of Anthropology, University of Georgia) - Kyle, Britney (Department of Anthropology, University of Northern Colorado) - Reinberger, Katherine (Department of Anthropology, University of Georgia) - Vassallo, Stefano (Soprintendenza di Palermo, Sezione Beni Archeologici) - Fabbri, Pier Francesco (Dipartimento di Beni Culturali, Università del Salento) - Patterson, Nick (Broad Institute of Harvard and MIT) - Pinhasi, Ron (Department of Anthropology, University of Vienna; School of Archaeology, and Earth Institute, University College Dublin) - Reich, David (Department of Genetics, Harvard Medical School, Boston; Howard Hughes Medical Institute, Harvard Medical School; Broad Institute of Harvard and MIT)

Presentation Format: Oral

Recent developments in archaeogenetics and an ever-increasing dataset of ancient and modern genomes allow us to address fine scale archaeological and historic research questions. For this study, we generated genome-wide data of 17 individuals excavated at Himera, Sicily, to determine their genetic ancestry.

In 480 BCE a major battle at the Greek colony of Himera ended in a decisive victory over the Carthaginian forces by a Greek alliance, ensuring that Greek city-states such as Syracuse retained control of much of Sicily. A second battle in 409 BCE ended in victory of the Carthaginian army and destruction of Himera.

Archaeological evidence of the battles comes from the western necropolis of Himera, where excavations uncovered several collective burials dated to the 5th century BCE. The exclusively male skeletons exhibited traces of battle trauma as well as weapons embedded in the bodies and were attributed to fallen soldiers of the Greek alliance. We compare these “soldiers” to previously analyzed ancient western Eurasian human genomes, including many from the Mediterranean region.

The individuals attributed to the Battle of 480 BCE show diverse ancestral backgrounds. When they are compared to previously published western Eurasian genomes, most individuals are closely related to Late Bronze Age individuals from Greece, but others show close affinities to populations of the European mainland. The ancient genetic samples currently available for comparison are quite distant from Himera in time and space, making such comparisons preliminary with regard to historical interpretation.

In contrast, the individuals associated with the second battle show a more homogeneous genetic pattern, consistent with historical accounts that combatants in 409 BCE were local Himerans who fought unaided.

Integrating these genetic data with historical and archaeological evidence provides unique documentation of fighting forces in

the ancient Greek world.

16 **ARCHAEOLOGY STINKS! FINDING SMELL IN ARCHAEOLOGY**

Author(s): Malik, Rose (Field Archaeology, University of York)

Presentation Format: Oral

Smell is a language, communicative and interpretive. It connects the physical, social, emotional and semantic, informing meaning and understanding. How can we engage with the intangible, invisible and incorporeal sense of smell? Is it possible to find smell in the past?

Historically, olfaction has often been considered a secondary sense player, only enhancing the more obvious senses of taste; not regarded as important as touch, sound or vision. Therefore, olfactory archaeology has primarily relied upon conceptual approaches.

Since 2000, empirical analysis into odorous biomolecules in ancient preservation has been building momentum. Even so there has been no consolidation of method, practice and interpretation put forward in archaeology.

Headspace sampling is a ground-breaking technique in archaeology which allows direct access to ancient odour molecules, for analysis and interpretation. By focusing on a critically aware methodology of excavation and analysis, resulting in demonstrable empirical information, this innovative technique allows us to explore inroads into sensorially-based socio-cultural narratives.

With a multi-disciplinary focus, the combination of empirical data and archaeological theory paves the way for presenting another dimension to archaeological investigations using odour molecules as primary source evidence.

Thus, whereas analysis of datasets may reveal the application of particular aromatic agents as part of anthropogenic preservation processes, the broader narrative around the 'essential' ritualised mortuary practice can be explored to provide an understanding of ancient 'existential' cognitive processes that express ontological significance within wider socio-cultural contexts.

Effectively, headspace sampling technique and methodology enables multi-faceted engagement which allows us to bridge the gap between disciplines and present strong evidence-based narratives and interpretations of past cultures.

This talk will illustrate how we can bring both science and theory to build a metanarrative around the treatment of the body and understand mortuary practices and go on to discuss what other types of preservation which could be explored.

17 **THE INFLUENCE OF AGING ON THE EXPRESSION OF SEXUALLY DIMORPHIC CRANIAL FEATURES**

Author(s): Petaros, Anja (National Board of Forensic Medicine in Sweden, Linköping) - Nociarova, Dominika (Independent consultant in anthropology, Autonomous University of Barcelona) - Wärmländer, Sebastian (Department of Biochemistry and Biophysics, Stockholm University; UCLA/Getty Conservation Programme, Cotsen Institute of Archaeology, UCLA)

Presentation Format: Oral

In anthropology sexing of human remains can be performed by anthroposcopic analysis of the skull where five morphological features are scored using an ordinal scale that goes from 1 (feminine) to 5 (masculine). Different intrinsic and extrinsic factors influence the expression of the single features, one being age. There has not been a lot of research on the effect of old age on sexual dimorphism. The aim of this study was to compare the expression of the five traits in individuals from the Coimbra Skeletal Identified Collection (CISC), Portugal pertaining to two age groups.

A total of 171 skulls (87 females and 84 males) divided in two age groups (25-35 yr vs >65 yr) have been analyzed and scored using the standardized ordinal scale. All features showed statistically significant sexual dimorphism in both age groups. The expression of the traits varied between age groups. In males, all features were more pronounced in the older age while in females the expression of traits was less pronounced. Both sexes showed statistically significant changes in glabella score with older individuals showing more pronounced glabellar region. The male group showed similar changes also in the occipital region. Discriminant function analysis showed better results in attesting sex in the group composed by older individuals.

The results of this study, although based on a relatively small sample that could in part be influenced by secular changes, suggest that older age could play a significant role in the expression of the five discrete cranial traits in both sexes showing a tendency in the increase of sexual dimorphism with age. Hormonal changes, longstanding influence of extrinsic factors such as muscle traction and edentulism could be factors leading to the observed changes and will be discussed in the presentation.

18 **BURIAL MOUND PEOPLE: BIOARCHAEOLOGICAL CASE STUDY FROM IRON AGE FOREST-STEPPE OF THE TRANS-URALS**

Author(s): Sharapova, Svetlana (Institute of History and Archaeology, Urals Branch of RAS, Ekaterinburg) - Cherdantsev, Stepan - Trapezov, Rostislav (Institute of Cytology and Genetics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk) - Pilipenko, Aleksandr (Institute of Cytology and Genetics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk; Institute of Archaeology and Ethnography, Siberian Branch of the Russian Academy of Sciences, Novosibirsk; Novosibirsk State University, Novosibirsk)

Presentation Format: Oral

In following paper, materials of the Sargat culture (500 BC – 300 AD) are presented as staging areas for bioarchaeological study. Due to its geographical location on the northern periphery of the nomadic world the material culture of the forest-steppe

population shows a very specific distinction. The scholarly consensus is that nomadic impact on the local population was of great importance so that rising aristocracy formed by nomadic and semi-nomadic clans plays a consolidating role. Archaeological excavations of the Sargat kurgans (burial mounds) evidence various forms of those interactions. At the same time, recent not-yet-numerous investigations of ancient DNA provide data supporting previously suggested hypothesis about southern influence in formation of the Sargat population. Thus, paper describes case study which is being undertaken for female individual from Karasie 9 cemetery (Tobol River basin). Archaeological excavation was complemented by field anthropological observation, which promoted to identify delayed burial practice. Other data such as pottery style, her sparsely furnished grave and intentional cranial deformation allowed us to consider her as a relatively privileged – and most likely nomadic – member of Sargat society. In course of on-going ancient DNA analysis there were obtained some data on mitochondrial lineage structure from Karasie 9 female, which will be compared in a context of various groups of the Sargat gene pool as well as within mitochondrial DNA diverse of Iron Age Eurasian nomads. And last but not least, together with results of paleopathological examination we can study rather individuals than the population in general. The paper will further show what kind of information is missing and how all aspects in details increase the scope of archaeological record.

Part of this research is being undertaken within IHA UB RAS theme (No.AAAA-A16-116040110036-1); paleogenetic study was financed by the Russian Science Foundation (RSCF) grant (project No. 1778-20193) (www.rscf.ru).

19 **MEDIEVAL MALARIA. A NEW APPROACH TO AN OLD DISEASE**

Author(s): Schats, Rachel (Leiden University)

Presentation Format: Oral

Malaria is known to have had—and still has—a massive impact on health. The disease is associated with debilitating symptoms such as fevers, muscle pains, and severe anaemia, incapacitating entire populations. Although currently absent in the Netherlands, written records indicate that the disease was endemic here from the 17th to the mid-20th century, mainly in the coastal regions. Since the medieval environmental circumstances, with its abundance of brackish water, would have created the perfect breeding ground for the mosquito transmitting malaria, the disease could have been a health problem of epidemic proportions. The paucity of historical information concerning disease in this period however means that malaria is only rarely included in discussions on medieval health, hampering our interpretations of past societies. Gaining a better understanding of malaria in the medieval period is therefore essential.

Several palaeopathological studies suggest that a skeletal indicator of anaemia, termed cribra orbitalia, can be used as a marker for malaria in the archaeological record. Although cribra orbitalia is commonly viewed as a non-specific stress marker, there appears to be a strong correlation between this orbital pathology and malaria. However, as the presence of this pathological lesion can only be viewed as indicative of malaria at best, a direct identification needs to be applied as well to be able to confidently comment on past malaria presence. This paper will discuss how macroscopic research of human skeletal remains combined with spatial analysis and a new biomolecular method will be able to shed light on past malaria spread and impact in the medieval Netherlands. In doing so, this paper will demonstrate that the combination of “old fashioned” macroscopic analysis with new types of analyses is key for getting ahead in bioarchaeological research.

20 **DENTAL MICROWEAR AND MESOWEAR AS PROXIES FOR CHILDHOOD DIET IN THE PAST**

Author(s): Bas, Marlon (Institute for Oriental and European Archaeology, Austrian Academy of Sciences)

Presentation Format: Oral

Childhood refers to both an extended developmental period unique to human life history, and a great variety of associated cultural constructions. The analysis of skeletal remains can provide important information about the diet of children in the past. Diet during childhood reflects the availability of food and the social status of children and has consequences on childhood mortality and the development of metabolic and cardiovascular diseases later in life.

We explore the potential of quantitative dental microwear and mesowear analysis techniques to answer questions about childhood diet. We evaluate the influence of dental ontogeny and diet composition on the processes of tooth wear. Measurements are made on the grinding wear facets of the second deciduous and first permanent molars. Facet shape and area (mesowear), and buccal and occlusal dental microwear are compared between age groups at different stages of dental development in medieval children and young adults from Sankt Pölten, Austria.

21 **PARAMASTICATORY TEETH MODIFICATION AS EVIDENCE OF SOFT MATERIAL PROCESSING IN THE MESOLITHIC-NEOLITHIC DANUBE GORGES, SERBIA**

Author(s): Edinborough, Marija (University of Melbourne)

Presentation Format: Oral

Technological knowledge and task-related activities of past populations are known mostly by analyses of material culture remains. In this study we use an alternative approach for reconstructing specific task-related activities by investigating paramasticatory use of human teeth. We have examined occlusal grooves as accidental modifications of teeth on the dentitions of 34 individuals from the Danube Gorges, Serbia (c. 9600–5500 cal. BC). The lesions were examined both macro and microscopically. Microscopical features of the lesions were analysed using Scanning Electron Microscope surface imaging, which enabled a comprehensive investigation of their etiology. Occlusal grooves were found on teeth of just three females in this population.

Our results reveal period-confided female participation in task-related activities involving soft materials (plant) processing (e.g. basketry and/or cordage). Finally, my approach offered the opportunity to: 1) prove that soft (plants) materials were processed in this population, 2) detect the individuals which were in possession of certain set of skills.

A. **DENTAL MICROWEAR ANALYSIS AS AN INDICATOR OF THE DIET: CASE STUDY OF A 17TH CENTURY NECROPOLIS FROM IAȘI, ROMANIA**

Author(s): Petraru, Ozana-Maria (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Groza, Vasilica-Monica - Popovici, Mariana (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research) - Bejenaru, Luminița (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology)

Presentation Format: Poster

In 2008, during a rescue archaeological excavation in Iași (Iași County, Romania), a necropolis of 17th century was discovered. From the necropolis were recovered 111 well-preserved skeletons, generating interest for a dietary study. Dental microwear has been used in attempts to characterize diet and it refers to the microscopic marks left on the enamel and dentine which reflects the mechanical properties of food and abrasives consumed in the weeks or months before death.

The aim of the present study is to characterize the dental microwear in order to approach the past peoples dietary related to environmental context and cultural hierarchy. The second molar (M2) was chosen for analysis. The contaminants were previously removed from dental surface in a supersonic cleaner. After a gold coating procedure, three micrographs were taken upon the paracon/paraconid with a Tescan Vega II SBH scanning electronic microscope (SEM) at an acceleration voltage of 30 kV. On each digitized micrograph, micromorphological features such as small pits, large pits, fine scratches and coarse scratches were analysed through MicroWear R package. Our results reveal a significant high number of scratches compared to the number of pits ($p < 0.01$) examined on the occlusal surfaces, in both males and females. The number of fine scratches is related with soft food, a high component of meat or processed food; although the scratches are predominantly, the presence of pits may induce a mixed dietary.

B. **IMAGISTIC ANALYSIS OF BONE BENIGN-TUMOR (OSTEOMA) IN A SKULL FROM HUMAN SKELETAL SERIES FROM IAȘI ROMANIA (15TH-19TH CENTURIES)**

Author(s): Petraru, Ozana-Maria (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Groza, Vasilica-Monica (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research) - Bejenaru, Luminița (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Popovici, Mariana (Romanian Academy – Iasi Branch, “Olga Necrasov” Center of Anthropological Research)

Presentation Format: Poster

This study is focused on a case of osteoma, a benign-tumor reported in a skeletal series found at the “Adormirea Maicii Domnului” Roman Catholic Cathedral from Iași (Romania). The series of 89 skeletons (children, adolescents, adults, mature and senile) is originated from inhumation tombs and reburials, dating from the 15th-19th centuries.

Benign tumours of the bone can be dangerous as they may grow and compress healthy tissues. Osteomas are rare in the temporal bone and could be caused by trauma, chronic infection, hormonal dysfunctions etc.

The bone benign-tumor was identified in the skeleton of a male of 55-60 years old, in the mastoid area of the left temporal bone. Radiological and computed tomography (CT) analyses show the case to be a homogeneous bone mass identified to be osteoma, a bone-tumor type reported for archaeological samples. The left paramastoidian anomaly has an intense opacity, it is oval with a net contour and homogeneous structure, with an interface to the adjacent bone of about 42 mm x 16 mm. In the skeleton with osteoma, there are not identified other pathologies.

C. **USING GEOMETRIC MORPHOMETRICS IN EVALUATION OF INTRAGROUP VARIABILITY: DENTAL MORPHOLOGY IN HUMAN POSTMEDIEVAL POPULATION OF IAȘI (ROMÂNIA)**

Author(s): Bejenaru, Luminita (Faculty of Biology, Alexandru Ioan Cuza University of Iași; “Olga Necrasov” Center of Anthropological Research, Romanian Academy – Iași Branch) - Popovici, Mariana - Groza, Vasilica-Monica (“Olga Necrasov” Center of Anthropological Research, Romanian Academy – Iași Branch) - Petraru, Ozana-Maria (“Olga Necrasov” Center of Anthropological Research, Romanian Academy – Iași Branch; Faculty of Biology, Alexandru Ioan Cuza University of Iași)

Presentation Format: Poster

The archaeological excavations carried out in 2008, in Iași România (N47.156392, E27.587453), in a urban necropolis of 17th century, revealed a human skeletal sample of great importance for studying typological diversity. The sample is represented by 111 skeletons unearthed from 60 inhumation tombs, belonging to 96 adults and 15 teenagers. This study addresses issues related to intragroup variability using as phenotypic marker occlusal groove patterns of second molars of adults. Geometric Morphometric technique was applied for this purpose. The quantitative data were collected by means of a set of landmarks located at groove intersections, and a set of semilandmarks located at the molar periphery. The coordinate data were used to Generalized Procrustes Analysis, thus obtaining Procrustes coordinates and Centroid Size. Principal Components Analysis was carried out on the partial warp scores and uniform components obtained from the partial Procrustes aligned landmark and semi-land-

mark coordinates using thin-plate spline decomposition based on the bending energy matrix. The PCA results and Centroid Size was performed in order to define the trends in second molar form.

Results reveal an important intragroup variability derived from dental morphology: the discriminative function of the upper second molar is mainly determined by the mesiobuccal surface and the fovea formed by the intersection of central, buccal and mesial grooves. In female, the buccomesial surface is more pronounced with a tendency to increase of paracone; more flattened in buccolingually plane. In male, the hypocone is smaller and more flattened in mesiodistal plane.

Statistical approaches used provide evidences that may be used to infer relationships between local biological human groups correlated with historical events.

D. PALAEOPATHOLOGICAL ANALYSIS OF COMMINGLED AND FRAGMENTARY HUMAN SKELETAL REMAINS: ALTERNATIVE APPROACHES, POTENTIAL, AND LIMITATIONS

Author(s): Katsimicha, Maria - Jakob, Tina (Durham University, Department of Archaeology)

Presentation Format: Poster

Bronze Age Aegean human skeletal assemblages are commonly characterised by high degrees of commingling and fragmentation, due to the burial customs of the period and preservation biases.

These characteristics render the study of pathological changes in such assemblages an arduous task and its integration in the archaeological narrative is severely restricted due to three fundamental challenges: (1) the 'elimination of individuality' caused by commingling, (2) quantifying prevalence rates without excluding partial preserved skeletal elements, and (3) data presentation that can produce patterns interpretable at population level.

A pilot study on a sample from the Late Helladic cemetery of Kallithea-Rampantania, Achaea, Greece explored an alternative methodology to analyse, record, and present data in order to address these issues.

Based on the recording of pathological changes as lesions present (instead of specific conditions) by skeletal element (instead of being inferred on the basis of individuals) the study suggested that: a) observed lesions should not be ignored even if they cannot be attributed to specific individuals; b) employing visual aids (visualised representation) and an alternative quantification as 'pathological' fragments by total number of fragments (of each specific element) can be used if no other method is applicable; c) following this approach, population-level patterns can be revealed, and -if associated with specific anatomical features- potentially allow differential diagnoses; d) differential diagnoses based on prevalence rate patterns, interpreted through the prism of the general demography of the cemetery, can result in contextualised interpretations.

Occasionally, fragmentation was found to be beneficial to the study of pathological changes, especially regarding observations that would have required destructive methods or expensive visualisation equipment, such as alterations to bone cross-sections or within the medullary cavity of long bones.

We anticipate that this newly developed recording method will aid future palaeopathological research of commingled and fragmentary human remains from archaeological contexts.

E. MICRO SAMPLING OF DENTINE AND BONE COLLAGEN FOR STABLE ISOTOPE ANALYSIS

Author(s): Curtis, Mandi - Beaumont, Julia - Koon, Hannah - Wilson, Andrew (University of Bradford)

Presentation Format: Poster

Carbon and nitrogen stable isotope analysis of dentine and bone collagen is used to study an individual's diet, nutrition, and mobility. Previous research has shown that high-resolution temporal sampling of dentine has shown the capability of providing information about diet and mobility during the formation of the collagen; however, temporal sampling of bone collagen has been limited.

This pilot study was conducted to determine if micro sampling of dentine and bone collagen could be used to increase the temporal resolution of carbon and nitrogen isotope analysis. The method was applied on modern samples. The teeth samples provided by individuals who signed consent forms to approve the use of their tissue for research purposes and the project was approved by the authorities at the University Hospital, Khartoum and the bone samples were faunal samples collected from a butchers shop.

The collagen was sampled from demineralized bone and dentine collagen using a New Wave Micro Mill. The micro mill is used to drill consecutive trenches in the dentine collagen following the growth pattern of the tooth. The data show carbon and nitrogen isotope ratio values averaged at every 3-4 months of tooth formation. Using the micro mill, osteons were samples from the bone collagen to provide a temporal resolution.

The results thus far indicate that both the dentine and bone collagen methods of sampling will increase the temporal resolution provided by incremental sampling.

F. ENTHESEAL CHANGES UNDER DEBATE: FIRST RESULTS FROM THE SKELETAL COLLECTION OF THE CHALCOLITHIC SITE OF CAMINO DEL MOLINO (MURCIA, SPAIN)

Author(s): Perez-Arzak, Uxue (Department of Geography, Prehistory and Archaeology. University of Basque Country - EHU-UPV) - Haber-Uriarte, María - Lomba-Maurandi, Joaquín (Department of Prehistory, Archaeology, Ancient History, Medieval History and Historiographic Science and Techniques. University of Murcia - UM) - Arrizabalaga, Alvaro (Department of Geography, Prehistory and Archaeology. University of Basque Country - EHU-UPV) - Trancho, Gonzalo J. (Department of Zoology and Physical Anthropology. Complutense University of Madrid - UCM)

Presentation Format: Poster

The enthesal changes (ECs), changes of the muscular, tendinous and ligamentous attachment sites of the bone, are features that have been used extensively to reconstruct activity from the human skeleton. Especially since the 1980s, there have been a lot of studies concerning these changes and their doubtful etiology.

The aim of this work is to contribute to this debate using the first results obtained from the analyses on Camino del Molino's sample. In this site, multiple burial was practised around the period between 2920-2340 BC. Both the material culture and the faunal remains suggest that these individuals probably practised agricultural and farming activities.

In this case, the upper limbs of 91 individualized adult subjects (39 male, 34 female, 18 indeterminate) are analysed macroscopically with the Santana's method (2011), scoring the enthesal changes in a five-degree scale (0-4). The statistics are completed with SPSS v.24.

The results do not show any significant intra-group differences. The lower scores are particularly significant (with higher frequencies in women) and, in general, there is a great homogeneity in the pattern of ECs. In addition, the association between age and ECs has been verified. Focusing on the nature of the entheses, the fibrocartilaginous ones show higher degrees - close to pathology- which indicate that biomechanical factors are also influencing the presence of these changes.

As a summary, the results of ECs in the Camino del Molino's sample are compatible with an agricultural society in which the sexual division of labour seems to be present but in a slight way since all members would participate in the economical organisation. Moreover, the multifactorial nature of the enthesal changes cannot be questioned. Currently, biologically more appropriate methodologies are being applied in this sample to reduce biases and to contrast the conclusions obtained in this study.

281 SCIENTIFIC DATING AND CENTRAL-WESTERN MEDITERRANEAN PREHISTORY: DEVELOPMENTS AND PERSPECTIVES

Theme: Archaeological theory and methods beyond paradigms

Organisers: Parkinson, Eóin (University of Cambridge) - McLaughlin, T. Rowan (Catalan Institute of Human Paleoecology and Social Evolution - IPHES)

Format: Regular session

The previous two decades have witnessed the widespread application of absolute scientific dating methods in Mediterranean prehistory, following a scholarly tradition dedicated to artefact seriation and typo-chronologies. This surge in research has resulted in an ever-growing body of radiocarbon data, enabling new understanding of the chronology and tempo of cultural change in Mediterranean prehistory. In light of this, we ask what have been the major developments in our understanding of regional chronologies in central-western Mediterranean prehistory over that past 25 years? What are the regions and time periods that required focused research? What are the methodological issues surrounding the application of absolute dating methods in central-western Mediterranean prehistory?

This session seeks to draw together active researchers working towards an improved understanding of the absolute chronology of the central-western Mediterranean area (the Balkans, Italy, southern France, Iberian Peninsula, Maghreb and their surrounding islands) during prehistory, from the 8th to 2nd millennium BCE. We aim to reinforce the obvious but often-overlooked fact that absolute chronology is central to our discipline, especially for the purposes of comparing trends between regions, or examining the archaeological context of environmental change. In light of the ever-growing body of chronological data and methodological advancements over the last 25 years, we invite papers that provide updated regional chronologies for central-western Mediterranean prehistory, especially those presenting new radiocarbon data or new methods for their analysis. Also invited are overviews of historical developments in absolute chronologies. Contributions can deal with an entire country, region or representative site, and we particularly welcome approaches that seek to reconcile absolute chronologies from scientific dating with more traditional approaches to chronology, or other sources of information such as palaeoenvironmental proxies.

ABSTRACTS

- 1 INTRODUCTION: SCIENTIFIC DATING AND CENTRAL-WESTERN MEDITERRANEAN PREHISTORY: DEVELOPMENTS AND PERSPECTIVES**

Author(s): McLaughlin, Rowan (Catalan Institute of Human Paleoeology and Social Evolution - IPHES) - Parkinson, Eóin (University of Cambridge)

Presentation Format: Oral

The previous two decades have witnessed a more widespread application of absolute scientific dating methods in Mediterranean prehistory. This surge in research has resulted in an ever-growing body of radiocarbon data in particular, enabling new understanding of the chronology and tempo of archaeological change in Mediterranean prehistory. This paper will introduce the session theme, before providing an overview of the state-of-the-art of absolute dating in the central-western Mediterranean using a database of ca. 3500 radiocarbon dates. We demonstrate how patterns of growth and decline can be identified, quantified, and mapped out, thus developing models of cultural evolution and economic fluctuation, and providing a backdrop for other archaeological and scientific narratives of population change and palaeodemographics. We also identify the geographic areas and time periods that need further work, assessing the quality of the radiocarbon data for the region through a quantification of what materials have been dated, and place the data within a wider European and North African comparative framework.
- 2 FIFTY YEARS, PLUS OR MINUS: THE IMPACT OF RADIOCARBON DATING ON ITALIAN PREHISTORY SINCE THE BEGINNING**

Author(s): Whitehouse, Ruth (UCL Institute of Archaeology)

Presentation Format: Oral

Although the remit of this conference session is the last 25 years, radiocarbon was first developed half a century ago; dates relating to the central Mediterranean trickled out over the subsequent decades and slowly started to have an impact on the understanding of Italian prehistory. In this overview, I pick out a few themes for discussion. One is the abandonment of the general diffusionist interpretation of European prehistory, with absolute chronology derived from historical dates from the east Mediterranean, via a series of links that proved in many cases to be illusory. A second theme is the stretching of the duration of cultures and phases, which has implications for the understanding of the pace of processes of social change. Another theme is the tendency of radiocarbon dates to form dating clusters, with the result that some chronological phases have many dates, while others are much more poorly represented; this raises questions about how we define the archaeological record and whether we are better at recognising long stable stages than those characterised by rapid change. Finally I discuss the specific issue of the date of the Final Bronze Age/Iron Age transition as an example of a clash between absolute dates derived from different systems (central European dendrochronological dates on the one hand and traditional dates for the foundation of Greek 'colonies' on the other) and the potential of radiocarbon to resolve the issue.
- 3 FOUR INTERESTING CHRONOLOGICAL PROBLEMS FOR CENTRAL AND WESTERN MEDITERRANEAN PREHISTORY**

Author(s): McLaughlin, Rowan (Catalan Institute of Human Paleoeology and Social Evolution - IPHES)

Presentation Format: Oral

In this paper I discuss some problems and their solutions that appear as recurring themes in work that attempts to build chronologies of Mediterranean prehistory. Firstly, I review the limited baseline of local marine carbon reservoir data that must be included in calibrations of radiocarbon dates from marine samples and mixed-reservoir samples (including Mesolithic hunter-fisher-gatherer human remains), and discuss how modelling and carefully targeted work can improve matters. Secondly, I discuss the typically poor chronological controls for palaeoenvironmental sequences in the region, and why assuming synchronicity in environmental and cultural change is dangerous. Thirdly, spatio-temporal 'edge effects' during episodes of population change are complex phenomena, especially for interactions between groups with different demographic properties. I consider the evidence for such edge effects embedded in radiocarbon databases from the Neolithic transition. Fourthly, I ask 'is evidence of absence really evidence of absence in the case of gaps and hiatuses in the radiocarbon time series?' This is particularly important in the case of Mediterranean islands, where the presence of empty phases may imply that there were lower limits to viable populations in isolated settings. The theme linking all these topics is how data-driven approaches to chronology can vastly improve our understanding of the past and the dynamics of human settlement over this pivotal region in world prehistory.
- 4 THE RADIOCARBON CHRONOLOGY OF THE EARLIEST NEOLITHIC OF WEST-CENTRAL AND NORTH-WESTERN ITALY**

Author(s): Pearce, Mark (Department of Archaeology, University of Nottingham) - Maggi, Roberto (LASA, University of Genova)

Presentation Format: Oral

It has become clear that the earliest Neolithic in western Liguria (northwest Italy) and Provence dates to the first half, perhaps the first quarter of the sixth millennium (Bayesian modelling in Pearce 2013; Binder et al 2017) and is earlier than that of central Italy, Sardinia and Corsica. It also only seems to be less than 200 years later than the earliest Neolithic of southern Italy.

This rapid expansion northwards raises the question of the mechanisms of spread, and in particular of the impact of Neolithic navigators in the intermediate areas. For example, barley pollen was found a deep core at Sestri Levante in peat levels dated AMS LTL 1007A: 7213±65 BP, 6222-5990 cal BC, which may document Neolithic pioneers at a convenient landing place in an intermediate area, though the presence of pollen suggests some permanence to occupation of the area, settlement that is so far unattested otherwise.

In this paper we will explore the nature of the data (for example, western Liguria has the best dated Neolithic sites in Italy, arguably the western Mediterranean), review current interpretations of the chronological data and suggest priorities for dating studies.

Binder D., Angeli L., Gomart L., Guilaine J., Manen C., Maggi R., Muntoni M., Panelli C., Radi G., Tozzi C., Arobba D., Battentier J., Brandaglia M., Bouby L., Briois F., Carré A., Delhon C., Gourichon L., Manrival P., Nisbet R., Rossi S., Rowley-Conwy P., Thiébaud S. 2017. Modelling the earliest western spread of Mediterranean Impressed Wares: new dates and chronicles. *Documenta Praehistorica*, 14: 54-77.

Pearce M 2013. Rethinking the north Italian early Neolithic. *Specialist Studies on Italy* 17. London: Accordia Research Institute.

5 A NEW RADIOCARBON-BASED SEQUENCE FOR EARLY ITALIAN METALWORK

Author(s): Iaia, Cristiano - Dolfini, Andrea (Newcastle University)

Presentation Format: Oral

Until recently, the appearance of a mature copper-based technology in Italy was understood as a 3rd millennium BC phenomenon, whose impact on the development of European metallurgy seemed relatively marginal. The recent application of radiocarbon dating to short-lived samples from Copper Age sites, many of which include metalwork, has changed this picture dramatically, by showing a precocious surge of polymetallic technology (including copper alloys, silver and antimony) in the mid-4th millennium BC, with remarkable antecedents in the late 5th and early 4th millennia BC. A research project conducted at Newcastle University (UK) in the years 2015-2017 has critically reassessed the evidence and built a new, comprehensive sequence of Italian copper-alloy axes, daggers and halberds from late 5th to late 3rd millennia BC. This task has been accomplished using different strands of analysis, including: (a) new ¹⁴C determinations from human bone samples associated with metal objects; (b) a new classification of artefacts which incorporates analytical information (wear analyses) and seriation of contexts comprising them; (c) typological comparisons with metalwork from other regions of Europe. The combined work resulted in a novel sequence of five metallurgical horizons (modelled using Bayesian statistics) spanning over two-thousand years, which sheds new light on the tempo and social dynamics of metallurgical development in prehistoric Italy vis-à-vis central Europe and the Mediterranean.

6 ROCK-CUT TOMBS OF THE CENTRAL MEDITERRANEAN REVISITED: A COMBINED TYPOLOGICAL, CONTEXTUAL AND CHRONOLOGICAL PERSPECTIVE

Author(s): Parkinson, Eóin (University of Cambridge)

Presentation Format: Oral

Rock-cut tombs are a key feature of the later prehistory of the central Mediterranean, although cross-regional syntheses of this important funerary tradition are few. Distributed across the central-southern Italian peninsula, Sicily, Sardinia and Malta, rock-cut tombs are widely known from Neolithic and Copper Age contexts. Previous overviews have mostly relied on tomb typology to explore the emergence and proliferation of the rock-cut tomb tradition, with few studies having actively considered their chronology. This has been in part due to a lack of detailed excavation reports and absolute dating, however, intensive research and new dating programmes over the past 25 years have transformed our understanding of the development and use of these important funerary monuments. This paper seeks to provide an updated overview of the development and proliferation of rock-cut tombs in the central Mediterranean area during the Neolithic and Copper Age through a combined approach that considers the available published radiocarbon data, tomb typology and contextual evidence. In doing so, this paper places the development of central Mediterranean rock-cut tombs within a securer chronological framework and highlights the geographical areas and time periods where further research is needed.

7 RADIOCARBON EVIDENCE FROM AGRIGENTO TERRITORY. PROPOSALS FOR A SYSTEMATIZATION OF CHRONOLOGY FROM THE EARLY COPPER AGE TO THE BRONZE AGE

Author(s): Gulli, Domenica (Soprintendenza Beni Culturali di Agrigento) - Terrasi, Filippo (Seconda Università degli Studi di Napoli)

Presentation Format: Oral

New radiocarbon dates from recent field-works carried out in some sites of the Agrigento territory and from some contexts excavated in the last century, allow a more accurate chronological framework, from the beginning of the Copper Age to the Early Bronze Age.

Recent fieldwork carried out in the necropolis of contrada Scintilia, allowed to identify two main phases: the Early Copper Age, with rock cut tombs, and the Early Bronze Age, with little chamber tombs. In the Rock-cut graves, containing multiple burials, it was possible to isolate the grave goods and to assign them to the individual burials. For each of these high precision dates that were obtained, which are therefore very important for the dating of the associated ceramics, attributable to the San Cono-Piano Notaro style, of the beginning of Copper Age, now precisely dated between the late fifth and early fourth millennium BC, in agreement with new some dates of peninsular contexts.

New dates for the Copper Age came from stratigraphical series of Vangu del Lupo cave, near Montallegro (Agrigento), with painted pottery of the Serrafferlicchio style, once considered datable to the Middle Copper Age, but with a very long development in this cave, from Early to Late Copper Age. Radiocarbon dates for Late Copper Age and Early Bronze Age contexts, consisting of both tombs and caves, allowed us to specify the date of painted and not painted ceramics.

This paper will present a revised chronology for the Copper and Bronze Age of the Agrigento chronology, proposing that the traditional "cultures" of San Cono Piano Notaro, Serrafferlicchio, Malpasso, S. Ippolito, Castelluccio, thanks to radiometric dating, do not represent a rigid chronological sequence, as they were defined in the past, only on the basis of ceramic typology.

8 REVISITING THE CHRONOLOGY OF THE BRONZE AGE NECROPOLIS IN MOKRIN (SERBIA)

Author(s): Radinovic, Mihailo - Krečković, Marija (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Porčić, Marko (Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade; Biosense Institute, University of Novi Sad) - Stefanović, Sofija (Biosense Institute, University of Novi Sad; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Presentation Format: Oral

Mokrin necropolis, situated in the northeastern part of the Republic of Serbia, is one of the most important Early Bronze Age cemetery sites and has been the subject of numerous studies aiming to answer important questions about social structure, culture and physical anthropology of the Early Bronze Age communities. However, the chronology of the necropolis is still poorly grasped – with only six radiocarbon dates placing the necropolis within the wide limits between 2100 and 1800 BC, fine-tuned chronology, especially when it comes to the relative sequence of graves, is a difficult goal to achieve, which in turn impedes deeper understanding of important anthropological and historical questions. Previous studies that tried to establish the relative chronology of Mokrin necropolis made use of analogies with other sites and seriations based on the presence/absence of traditionally (subjectively) established types of grave goods. In this study we revisit the issue of the relative chronology of the Mokrin necropolis. We recorded the shape of the pottery vessels using morphometrics in order to have objective measure of vessel form variation as a basis for the phyletic seriation. Multivariate statistics is used to derive seriation solutions based on different metric attributes combined with qualitative attributes. We compare our results with previously proposed chronologies and to the available radiocarbon evidence.

9 GOING INTO THE DEEP BLUE SEA: NEW INSIGHTS INTO THE COLONISATION OF THE CANARY ISLAND IN THE ANTIQUITY

Author(s): Santana, Jonathan (Durham University) - Morales, Jacob (Universidad de Las Palmas de Gran Canaria) - Fregel, Rosa (Universidad de La Laguna) - Rodríguez, Amelia (Universidad de Las Palmas de Gran Canaria)

Presentation Format: Oral

This contribution explores the timing and patterns of the colonisation of the Canary Islands (Northwestern Africa). The first settlement on this oceanic archipelago represents the westernmost limits of Mediterranean human colonisation in the antiquity. Most archaeological, anthropological, and paleogenomic evidence suggests that the pioneer population came from North Africa. Furthermore, the archaeological evidence indicates that, after their arrival, these first colonists remained isolated until a new colonisation wave, this time by the Europeans in the 14-15th centuries AD. The chronology of the first settlements has yet to be properly resolved, and there is great uncertainty about the factors that drove them to explore and colonise these islands. There are several hypotheses about this topic, considering different archaeological and historical data: 1) A Phoenician/Punic enterprise dating from the early first millennium BC is mainly based on radiocarbon dates of non-identified charcoal and affinities of material culture items. 2) A Roman colonisation at the late first millennium BC that occupied and exploited the islands as a place that could provide different valuable commodities. It is based in Roman evidences from Lanzarote Island and Lobos islet. 3) A third one proposes that the archipelago was settled down by farmers from North Africa at the first millennium AD, and it does not consider a commercial goal in this enterprise. The current accelerator mass spectrometry (AMS) dates appear to support the latter hypothesis, at least for Gran Canaria. Furthermore, paleogenomic evidence indicates that the colonisation process involved multiple waves of migration that are poorly understood so far. We take into consideration all the available evidence to produce an update picture of this process in Gran Canaria Island as a model that could be considered for the entire archipelago.

282 NEW DEVELOPMENTS IN THE BIOARCHAEOLOGICAL STUDY OF CREMATED BONE

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Snoeck, Christophe (Vrije Universiteit Brussel; Université Libre de Bruxelles) - Leskovar, Tamara (University of Ljubljana)

Format: Regular session

Throughout time and space, human societies have and still are treating their dead in various ways, including cremation of the deceased. As the burning of the body is only one part of the process, funerary rites as a whole can vary significantly, offering a unique insight into the beliefs and habits of different societies. Even though cremated remains are relatively common find in the archaeological record, reasons behind the choice of specific ritual and its course remain largely unknown. Indeed, because of the very high temperature reached during cremation (up to 1000°C and above), encountered remains are often incomplete and their physical and chemical structure highly altered. Consequently, it was believed for a long time, that only limited information can be

extracted from cremated skeletal remains, leaving many blank pages in the archaeological records.

Inventing methodologies have demonstrated that various macroscopic, microscopic, spectroscopic, molecular and isotopic analyses of cremated remains can yield authentic results, improving our understanding of not only various aspects of cremation practices (e.g. pyre characteristics) and heat-induced changes in the remains, but also provide reliable substrate for radiocarbon dating, mobility studies, MNI evaluation and differentiation between animal and human remains in commingled assemblages, even enabling the application of ageing and sexing techniques.

This session aims at sharing the latest developments in the bioarchaeological study of cremated skeletal remains. We welcome papers focusing on experimental work and/or any analyses related to cremated skeletal remains from archaeological contexts, offering new or improved methodological practices and/or understanding of the cremation ritual.

ABSTRACTS

1 **CINIS SUM, CINIS TERRA EST: DECHYPERING CREMATION RITUAL IN THE ROMAN CITY OF SALACIA (ALCÁ CER DO SAL, PORTUGAL)**

Author(s): Silva, Filipa (Research Centre for Anthropology and Health Department of Life Sciences, University of Coimbra)

Presentation Format: Oral

Salacia (currently Alcácer do Sal, Portugal) was one of the most important cities of the Roman Lusitania province. From one of its funerary areas, named Azinhaga do Senhor dos Mártires, located on the west/northwest, were examined 57 cremation graves. Those represent mainly urned secondary burials, dated from the first to the second century AD. The cremated bones and teeth were subjected to macroscopic and metric analysis in order to gather information about the biological profile of individuals, the cremation process and the funerary practices involved.

At least 65 individuals, one of them not cremated, corresponding to 14 non-adults, 40 adults (9 men, 12 women and 19 undetermined) and 11 of an undetermined age group were found. Regarding cremation ritual, except one case, no individuals under six months were detected, in accordance with the customs at the time. Approximately half of the individuals were subjected to incomplete cremations. Furthermore, no significant differences were found on burning degree by age group and sex.

The bone color, as well as the high percentage of deformation and curved transverse fractures suggest that most of the studied individuals would be cremated during the cadaver phase, that is, shortly after death. Concerning the bone collection from the pyre on secondary burial it was exhaustive, especially among adults. Nevertheless, the co-analysis of the characteristics of the graves and the biological profile of individuals (age and sex) shows no significant differences in the funerary treatment given to those individuals.

Details about the individuals and procedures involved in the cremation burials from Salacia were deciphered for the first time through anthropological analysis, which further develops our knowledge about the Roman funerary world.

2 **ANALYSIS OF FUNERARY PRACTICE THROUGH INTERPRETATION OF FRACTURE PATTERNS ON CREMATED HUMAN REMAINS: A PILOT STUDY**

Author(s): Monetti, Lisa (UCL Institute of Archaeology)

Presentation Format: Oral

By reconstructing the practical and ritual acts of a funeral, a better understanding of how the living interacted with and treated the dead can be realised. Through the analysis of cremated bones from Roman Britain, this research attempts to develop an understanding of the funerary ritual of the time. Cremated human bone is an abundant resource in the archaeological record, and with the proper analysis, it can contribute to the understanding of all stages of the funeral process.

The project identifies differential burning on the skeleton through a novel analysis of fragment size and shape using a method borrowed from potsherd analysis. Utilising the software ImageJ and a script adapted for cremated bone, the shape and size of burned bone fragments are measured from photographs. These data are recorded with information about the fragment and skeleton. Then, all measurements (area, circularity, maximum length, and solidity) of fragments are analysed by group (bone, bone type, skeletal regions, side, burial, site, and site type) to identify patterns or variations that may have been caused by funerary ritual or practice. This research also takes into account other possible causes of fragmentation and fracturing, particularly taphonomic agents, when assessing these attributes.

A pilot study analysing over 2000 fragments has been conducted and trends are emerging, one perhaps suggesting arm position of the deceased on the pyre. This presentation will discuss the results of the pilot study and further describe the plan for the continuing interpretation of the funeral through analysis of cremated human bone, including the use of experimental cremation, which is contributing to the author's PhD thesis. While this project attempts to expand understanding of funerary customs in the context of Roman Britain, this thorough analysis will also contribute to a baseline understanding of the expected fracture patterns observed on cremated bone fragments.

- 3 THE INFLUENCE OF TEMPERATURE-RELATED ALTERATIONS OF THE BONE'S MICROSTRUCTURE FOR HISTOLOGICAL AGE DETERMINATION**
Author(s): Otto, Larissa (Department of Biology I, Ludwig-Maximilian-University of Munich) - Braun, Christian - Graw, Matthias (Institute of Legal Sciences of the Ludwig-Maximilian-University of Munich) - Grupe, Gisela (Department of Biology I, Ludwig-Maximilian-University of Munich)
Presentation Format: Oral
- At present, the major challenge to the analysis of cremated human remains is still due to thermally-induced alterations of the bone's macro- and microstructure. In order to improve common ageing methods for cremated human remains, a catalogue of micromorphological criteria, which were observed at different temperatures during experimental cremation, was developed. For this purpose, known-age archaeological and forensic compact bone samples from femur and tibia were used. Different histomorphometrical parameters were analyzed at different cremation temperatures, ranging from 100 to 1000°C, in comparison with corresponding pieces of unburned reference samples.
- For most of the parameters that were taken into consideration, no temperature-induced changes could be observed, which is a major advantage for the histological age at death-determination of cremations. However, for some important metabolism-related histomorphometrical parameters such as the activation frequency, changes at different heating temperatures could be observed, which do have an impact on the results of histological age determination.
- Through these insights, further analyses can be performed concerning the development of histological age determination formulas for cremated human remains.
- 4 EXPERIMENTAL BURNING AS A METHOD OF STUDY OF THE ANTIQUE CREMATION TECHNIQUE**
Author(s): Svirkina, Natalya - Volodin, Semen (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral
- The series of experimental cremations was carried out within the framework of research project dedicated to the study of antique cremation from the Phanagoria necropolis (Taman Peninsula, Krasnodarsky Krai, Russia). The purpose was to reconstruct the burial rite and clarify such details as construction of the funeral pyre, its duration and temperature, body position, wood type.
- The experiment based on the evidences from archaeological, written and graphic sources of the antique era. Cremation took place outdoors and about 2.5 m³ of oak firewood was used to create a funeral pyre. We used the pig corpse weighing about 50 kg. It was placed on the top of the construction. The cremation lasted for 4 hours and 55 minutes. The temperature of the pyre ranged from 611 to 940 °C. The total weight of the remains was about 650 grams. The size of cremated bones fragments did not exceed 80 mm. The color of fragments ranged from brown and black to white. On the several fragment the light-pink, yellow and blue colored pigmentation have been identified. There are no traces of direct exposure to heat on some bones (sacrum, ilia, femur). We noticed only straight cracks on the bone fragments. Parabolic cracks or deformations are not detectable.
- We can conclude that oak is the optimal fuel for high-temperature outdoors cremation. The duration of burning in this case lasts at least for 5 hours at 600-940 °C. Moreover, funeral pyre should be organized in the way when body is exposed to heat from all sides even after destruction of pyre construction.
- The obtained cremated remains differ from antique analogies. The reasons for this difference may be in miscalculations during experiment or unaccounted funeral rite details. The experiment results also revealed a range of methodological issues questions. The study supported by RFBR #18-39-00154.
- 5 FRAGMENTATION OF CREMATED REMAINS IN WATER-QUENCHED VS. SLOWLY EXTINGUISHING PYRES – EXPERIMENTAL APPROACH**
Author(s): Jaskulska, Elzbieta (Institute of Archaeology of the University of Warsaw)
Presentation Format: Oral
- One of the obvious problems in analyzing cremated remains is the encountered fragmentation of bones. The level of fragmentation tends to significantly differ between archaeological sites or even between features within one site indicating that some other factor than deceased biological profile or post inhumation damage is responsible. In Polish archaeology, one of the commonly used explanation is hypothetical custom of putting out the fire with water. The author has researched the theory by experimental cremation of pig (*Sus scrofa* d.) extremities and recorded differences between pyres that were quenched with water at different times and pyres where fire was allowed to slowly die out. The fragmentation has been measured according to method proposed by McKinley (1994). The small scale of the experiment did not allow for statistical analysis though there was a considerable difference in fragmentation between the quenched pyres and the naturally extinguished pyre. Following the hypothesis, the quenched pyres had a higher amount of small and medium fragments (size >2 mm: 7-8% of total mass of remains and >5mm: 24-25% of total mass of remains) to extinguished pyre (accordingly size >2 mm: 3.5% and >5 mm: 13%). Nearly 80% of fragments gathered from extinguished pyre were over 10 mm long when in case of other pyres only 40-47% of fragments has fallen in this category. Contrary to popular concepts though the slowly cooling pyre remains had much more solid structure and were more durable as indicated by increased volume of bone dust gathered after transportation and prolonged storage. This characteristics seems to indicate some significant difference in microstructure and crystallinity of the remains treated differently during cremation ritual.

6 SHOULD COMPUTED TOMOGRAPHY BE A STANDARD PRACTICE IN THE RESEARCH AND DOCUMENTATION OF CREMATION URNS CONTENTS?

Author(s): Rogóż, Joanna (Institute of Archaeology, University of Rzeszów) - Truskiewicz, Adrian (Institute of Nursing and Health Sciences, University of Rzeszów)

Presentation Format: Oral

Cremaion urns due to their special contents are not an easy object to explore. Burned fragile human bones can be densely packed, clumped with soil. Meanwhile, the computed tomography method is still not a common practice in the documentation of funerary urns, nor is the support in exploration and analysis of their contents.

The aim of the study was to accurately capture the contents of urns before exploration and to document it. Then the confrontation of the state of bone fragments before and after extraction from the vessel.

Several urns from south-eastern Poland were examined:

- 6, site No. 6, Dębina (Podkarpackie province), 2015, Tarnobrzeg Lusatian culture;
- 3, site No. 1, Pysznica (Podkarpackie province), 2018, Tarnobrzeg Lusatian culture;
- 2, site No. 23, Kawczyce (Świętokrzyskie province), 2018, culture is still unidentified.

Tomographic examinations of the urns were performed at the Faculty of Medicine at the University of Rzeszów. Urn research from Pysznica and Kawczyce was carried out as part of the departmental project No. IA-22/2018/508: „Multifaceted urn and bones examination using advanced research methods”. Bearing in mind what the tomograms present, careful bone extraction was initiated and then the bones were subjected to macroscopic anthropological analysis. Thanks to this procedure, we know that many small pieces belonged to larger bone fragments.

The tomograms show the state of the bones inside the urn, although not always clearly legible. Undoubtedly, however, they are an excellent method of documenting this kind of burials. Knowledge of the content of the vessel before its exploration allows you to carry out this process more effectively. The analysis of tomograms and the method of exploration have an influence on the conclusion not only about the actual size of bone fragments placed in the urns, but also about their belonging to a given part of the skeleton.

7 THE USE OF FIRE ON THE HUMAN REMAINS IN A MINOAN TOMB: THE CASE OF THOLOS B AT KOUMASA, CRETE

Author(s): Triantaphyllou, Sevasti (Aristotle University of Thessaloniki) - Snoeck, Christophe (Free University of Brussels) - Chatzikonstantinou, Yannis (Aristotle University of Thessaloniki) - Panagiotopoulos, Diamantis (University of Heidelberg)

Presentation Format: Oral

To date, burning has been variously interpreted in funerary contexts in Minoan Crete as an act of fumigation, practical cleansing of the human bones, or a symbolic practice. Recent excavation of the tholos tomb B at Koumasa in southern Crete revealed a large number of human remains heavily affected by fire set inside the tomb. A combined set of methodologies regarding the collection, documentation as well as the macroscopic study and the application of a variety of analytical methods will shed new light on aspects of the manipulation of the deceased in prepalatial Crete. Issues which will be investigated include the use of fire in fleshed or partly defleshed body parts, the temperatures reached and the extent and intensity of fire lit inside the tholos tomb as well as the demographic composition, the levels of health and oral status of the people buried. In particular, the results of the macroscopic examination of the cremains will be combined with the Fourier Transform Infrared Spectroscopy (FTIR) alongside the oxygen stable isotope analysis in order to record compositional and structural changes in bone, to identify degrees of burning intensity and discrete temperature variation between samples burned in low, medium and high temperatures, to distinguish burned from unburned bone as well as to investigate the degree of oxygen circulation in the pyre. In parallel, preliminary experimental work in animal cadavers in different stages of decomposition simulating outdoor as well as indoor thermal conditions have contributed enormously to our understanding and recording of the technology of fire and the changes observed on bone structure related to the fire. The combined application for the first time in Aegean funerary assemblages affected by intense fire of state-of-the-art analytical tools will revise several stereotypes relating to the manipulation of the deceased in prepalatial Crete.

8 SHOED OR NOT: EXPERIMENTS TO DETECT GARMENTS WORN BY THE DECEASED. CONTRIBUTION OF BIOCHEMICAL ANALYSES ON CREMATED BONES

Author(s): Salesse, Kevin (Research Unit: Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles; UMR 5199: "PACEA - De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie", University of Bordeaux) - Snoeck, Christophe (Research Unit: Analytical, Environmental & Geo-Chemistry, Department of Chemistry, Vrije Universiteit Brussel; G-Time Laboratory, Université Libre de Bruxelles) - Capuzzo, Giacomo (Research Unit: Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Sabaux, Charlotte (Department of Archaeology, Ghent University) - Sengeløv, Amanda (Research Unit: Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Stamataki, Elisavet (Maritime Cultures Research Institute, Department of Art Sciences & Archaeology, Vrije Universiteit Brussel) - Dalle, Sarah (Department of Archaeology, Ghent University) - Hlad, Marta - Annaert, Rica (Maritime Cultures Research Institute, Department of Art Sciences & Archaeology, Vrije Universiteit Brussel) - Vercauteren, Martine (Research Unit: Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles)

Presentation Format: Oral

If post-cremation life histories of cremated bones and cremation-related deposits can be readily investigated as they refer to the last handling of the deceased, the treatment of the corpse during the burning act itself is little addressed by textual sources or debated in anthropological studies. Among the topics discussed are questions whether the individuals were buried clothed or not and criteria for evaluating indirectly the wealth of deceased or their social status in the past. This study aims to identify – through stable isotope evidences ($\delta^{13}C$, $\delta^{18}O$), infrared indices (IRSF, CN:P, etc.), and elemental concentrations on calcined bones – if the deceased was shod or not, and whether the burned elements of garments were worn by the dead or simply placed on the pyre. As the shoes are likely one of the most resistant clothing items to fire and might represent a proxy to discuss the presence of any garments items inside the burial. It is hypothesized that foot bones encased in shoes might experience heating conditions characteristic to confined-space cremation (low oxygen availability, poorly ventilated). These heating conditions could be related to the fact of presence or absence of shoes. For this, we carried out a series of outdoor burnings and laboratory heating experiments. Ventilated and unventilated shoes have been made using vegetable tanned leather (cow and goat). Animal feet (i.e. pig), used as proxies for humans, have been burned according different heating conditions. Results from these experiments will be presented. Recent advances in biogeochemical techniques present a unique opportunity to be able to characterize the cremation and bring a new breakthrough in our current archaeo-anthropological knowledge of the burning act itself through time.

9 THE CRYSTALLINE STATE OF EXPERIMENTALLY CREMATED BONE

Author(s): Greiner, Martina (Department für Geo- und Umweltwissenschaften, Ludwig-Maximilians-Universität München) - Rodríguez-Navarro, Alejandro (Departamento Mineralogía y Petrología, Facultad de Ciencias, Universidad de Granada) - Heinig, Mario (Department für Geo- und Umweltwissenschaften, Ludwig-Maximilians-Universität München) - Mayer, Katrin (Fakultät für Biologie, Anthropologie und Humangenomik, Ludwig-Maximilians-Universität, Planegg-Martinsried) - Kocsis, Balazs (Department für Geo- und Umweltwissenschaften, Ludwig-Maximilians-Universität München) - Göhring, Andrea - Toncala, Anita - Grupe, Gisela (Fakultät für Biologie, Anthropologie und Humangenomik, Ludwig-Maximilians-Universität, Planegg-Martinsried) - Schmahl, Wolfgang (Department für Geo- und Umweltwissenschaften, Ludwig-Maximilians-Universität München)

Presentation Format: Oral

We studied the crystallographic change occurring during experimental cremation of fresh biological bone mineral (bioapatite) with different heating times and temperatures. We combined various complementary analytical methods to the same raw and heat treated material such as X-ray powder diffraction (XRPD) with Rietveld refinement, Fourier Transform Infrared Spectroscopy (FTIR), and Infrared-coupled Thermogravimetric Analysis (TGA-FTIR). In addition, we correlated the analytical results with empirical indicators such as crystallinity indices and bone colour changes in consequence of heat treatment.

We observe a structural change of bone during cremation, most profoundly at temperatures from 700 °C after 30 minutes of heating. At those conditions, a considerable recrystallization reaction from bioapatite to hydroxyapatite occurs accompanied by a pronounced increase of the apatite crystallite size. However, already at temperatures below 700 °C, the bone carbonate content is reduced and the amount of hydroxyl groups increases. This transformation reaction mainly sets in after organic compounds in the bone have been combusted which enables direct contact between the apatite grains. Moreover, above 800 °C the mineral buchwaldite (NaCaPO₄) is formed from the Na component within the bone. Our results can be applied to determine the cremation conditions of archaeological bone finds.

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MNI DETERMINATION IN CREMATED HUMAN REMAINS THROUGH OSTEOLOGICAL AND STRONTIUM ISOTOPE ANALYSIS OF MULTIPLE BONES

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Presentation Format: Oral

Assessing the MNI of cremated human remains is extremely difficult due to the fragmentary state of the remains found in urns, pits and other contexts. Often, osteological analyses alone cannot discriminate between different individuals. In this paper, we present preliminary strontium isotope results from three Roman necropolises from geologically diverse areas from modern-day Belgium. These results suggest that strontium isotope analysis can contribute to establishing the MNI in cremation graves. By analysing different bones from the same deposit, such as cranial fragments, diaphysis fragments, rib fragments, and animal bones, etc., it is possible to gain insights into individuals' life histories. However, when the strontium isotope data shows completely different signals for bones with similar turnover rate within the same deposit, the results do not seem to correspond with multiple migration events in the persons' past. Instead, this suggests the presence of more individuals in the cremation deposit than determined during the osteological examination. These results offer new perspectives for the application of Sr isotope analysis in osteology.

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USING THE HUMAN EAR BONE (PARS PETROSAL) TO ASSESS PLACE OF BIRTH FOR CREMATED REMAINS

Author(s): Dunn, Katherine (Australian National University) - Valera, Antonio (NIA - ERA Arqueologia S.A.) - Wood, Rachel (Australian National University) - Grün, Rainer (Griffith University) - Frieman, Dr. Catherine - Fallon, Dr. Stewart (Australian National University) - Godinho, Dr. Ricardo (Universidade do Algarve) - Robinson, Dr. Marcus (University of Sydney)

Presentation Format: Oral

Place of birth can be traced using the strontium isotope ratio ($^{87}\text{Sr}/^{86}\text{Sr}$) in skeletal remains. Dental enamel is often used, as remodelling does not occur beyond crown development. However, enamel found within cremated remains is often too fragmentary for analysis.

The dense otic capsule of the petrous (ear) bone is thought not to remodel beyond the first two years of life (Frisch, et al., 2000), and often survives well in cases of human cremation (Harvig, et al., 2014). However, very little work has focused on whether this bone remodels in human, with no study yet to produce an absolute turnover rate. To establish accuracy in the Sr isotope signatures on cremated petrous bones for use as an alternative to tooth enamel, samples taken from recently deceased cadavers born in the 1940s were dated. Based on the radiocarbon bomb-curve, results demonstrated that turnover does occur in the petrous bone, but in the otic capsule turnover is limited.

This study will also present a case study on migration from Pit 40 at Perdigoões, a Chalcolithic ditch-enclosure site in Southern Portugal. Results from strontium isotope analysis of cremated petrous bones from this site will be discussed to assess its potential for expanding the capabilities of strontium isotope analysis and migration tracing using cremated bone.

A.

BODIES ON FIRE: TRACING THE PRACTICE OF BURNING THE HUMAN REMAINS IN THE PREHISTORIC AEGEAN THROUGH MACROSCOPIC METHODS

Author(s): Triantaphyllou, Sevasti (Aristotle University of Thessaloniki)

Presentation Format: Poster

Exposure of the body to fire causes various physical and chemical alterations which involve shrinkage, breakage, warping, complete deformation as well as removal of the organic component and the modification of the inorganic crystal component of the bones. Varying degrees of heat-induced effects predominate on human remains due to fire set up deliberately in direct contact to the human body and these are interpreted as the result of an elaborate and time-consuming procedure widely known as cremation. Similar effects are also evident when burning is applied on funerary contexts as an act of fumigation, practical cleansing of the human bones, or a symbolic practice. Variations in the procedure of firing may reflect different social behaviors and ideological and cosmological attitudes to the human body by the living communities. Regarding ancient Greece, burning of the human body has been identified almost exclusively with the practice of cremation which until a few years ago the latter was considered to represent a novel mode of disposal having occurred soon after the collapse of the Mycenaean palaces in the 13th c. BC. Current presentation aims to trace the evidence of burning of the human remains throughout the prehistoric Aegean and reconsider the old-standing view of the 'sudden' emergence of the practice and its link with exogenous factors. Instead, particular emphasis will be given on the occurrence of cremated remains as early as in the Mesolithic and the Early Neolithic as well as

on the variable intensity of exposure of the human remains in firing conditions throughout the Aegean prehistory. Systematic collection of the new evidence associated with macroscopic investigation of the cremains will unfold the complexity of the mortuary practices in the Aegean involving more frequently than initially considered the interference of fire with the human remains.

B. MOBILITY AT HEATH WOOD VIKING CREMATION CEMETERY, INGLEBY, DERBYSHIRE: THE ISOTOPIC EVIDENCE

Author(s): Loeffelmann, Tessi (University of Durham) - Claeys, Philippe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel) - Montgomery, Janet (Department of Archaeology, Durham University) - Richards, Julian (University of York) - Semple, Sarah (Department of Archaeology, Durham University) - Snoeck, Christophe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel; G-Time Laboratory, Université Libre de Bruxelles)

Presentation Format: Poster

The changes observable in the funerary archaeology of the early medieval period in Britain - especially in the context of the re-occurrence of the cremation rite - have often been linked to the movement of people. This is the case first during the fifth and sixth centuries when cremation burials appear with the arrival of the Anglo-Saxons and later in the ninth and tenth centuries, when the first Scandinavians reached the shores of Britain. Most funerary evidence for a Viking presence in Britain occurs in the form of inhumation burials and only one cremation cemetery from this period has so far been discovered: the barrow cemetery at Heath Wood, Ingleby, in Derbyshire. This cemetery consists of fifty-nine known burial mounds of which a small number have so far been excavated to reveal cremation deposits (Richards 2004). It is believed that the cemetery is linked to the historically documented over-wintering of the Viking Great Army at Repton in AD 873-4 and thus, by its very nature, has high potential to include foreigners to Britain. We used a relatively new method for strontium isotope analysis suitable for cremated bone (Snoeck et al 2015) in order to explore the origin of a small selection of animals and humans recovered from two mounds. With this poster we present, for the first time, indications for mobility based on strontium isotopes in cremated individuals and animals from the early medieval period in Britain. This highlights the potential of the method for other early medieval sites which contain a large number of cremation burials, but which have so far remained unexplored isotopically.

283 EMERGING NODES OF POWER IN IRON AGE EUROPE: THE SEVENTH CENTURY BC

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Potrebica, Hrvoje (University of Zagreb) - Metzner-Nebesick, Carola (Ludwig-Maximilians-Universität München) - Nebelsick, Louis (Cardinal Stefan Wyszyński University in Warsaw) - Pearce, Mark (University of Nottingham)

Format: Regular session

The Seventh century BC is the time when a new, powerful and intricate communication network arises across Europe. It stretches over large areas north and south of the Alps, from the steppe to the Atlantic façade. Current archaeological research divides this space into several cultural areas which usually overlap as result of different defining criteria, terminology and cultural concepts. This also applies to the nomenclature of period itself: Hallstatt, Early Iron Age, Orientalising Period, early Scythian Period - which reflects both competing traditions of archaeological research but also, more importantly, the cultural heterogeneity of a continent in the process of appropriation, adaptation and rejection of Mediterranean and Near Eastern Models. Our aim is to go beyond these labels and their different local meanings and attempt at Europe-wide comparison.

We are looking for submissions that will concentrate on:

- places or areas that were a driving force behind newly-established or renegotiated networks
- the distributive role and/or scope of such networks in terms of people, goods, and technologies
- processes of transformation related to long distance communication on the level of individual centres/regions as well as on trans-regional scale
- relations between social structure and power of individual centres within communication networks
- the cohesive force that kept these networks running (elite ideology or ?)

This session will take a cross-continental perspective, but we would like to identify places and/or communities who were not just passive distributors but were more dynamically involved in maintaining and shaping communication in terms of form and content between individual nodes as well as in surrounding areas. The chronological focus is on emergence of 'nodes of power' in the seventh century BC, but this process should be contextualised within more long-term continuity, discontinuity and change.

ABSTRACTS

1 ... A TOWN IS A TOWN WHEREVER IT IS

Author(s): Pearce, Mark (Department of Archaeology, University of Nottingham)

Presentation Format: Oral

Discussions of Iron Age urbanism are under-theorised and tend to take as their measure of what constitutes a town an idealised model of the classical Mediterranean city. Such an argument has a range of problems. Firstly it perpetuates the illusion of a classical ideal, secondly it is teleological, presupposing that there is only one outcome of processes of urbanisation and thirdly

it ignores a wide-range of urban phenomena that are historically and ethnographically documented.

This paper will take as its starting point Fernand Braudel's discussion of Pre-modern towns (in *Capitalism and Material Life 1400-1800* [London: 1973]) to explore what medieval European towns can tell us about Iron Age towns. I will argue that a wide range of urban phenomena are documented in Pre-modern Europe and that the features of these towns enable us to identify a wide variety of urban phenomena in Iron Age Europe, contributing to the debate on emerging nodes of power in the seventh century BC.

2 FROM CENTRAL PLACES TO TOWNS; ETRURIA AND OLD LATIUM DURING THE 7TH CENTURY BC

Author(s): Nijboer, Albert (University of Groningen)

Presentation Format: Oral

One of the results of Trigger's research into several early civilizations worldwide, is the following outline for the development from central places to towns: What stimulated increased economic interdependence and political integration in early civilizations seems to have been the trade and craft specialization encouraged by the politically motivated demands of the upper classes for prestige goods and by expanding markets for better-quality mass-produced commodities as population densities increased (Trigger 2007, 342). Craft specialization for elites contributes to emerging surplus production by many for personal progress of a few and is symbolized in prestige goods. It furthermore plays a part in the rise of regional, central places, settlement hierarchies and long distance exchange networks. Population densities within such centres need to rise to thousands for the upswing towards full urbanisation associated with monumental architecture, an infrastructure on a large scale and commodities produced in workshops by few, for many, leading to a substantial upsurge in archaeological visibility. This is a fundamental modification from the previous accent on the manufacture of luxuries by few, for few. It is closely linked to the process of social stratification and the formation of class societies, some of which endure. Often such central places do not last for centuries on account of competition and unsustainable social hierarchies for the communities and networks at hand. An illustration of such developments can be found in Etruria and Old Latium during the 7th century BC. From 700 to 600 BC the main, established centres continue to develop while some other nodes or centres in the exchange networks were hampered in their growth. One can think of centres such as Verucchio or Marsiliana d'Albegna that probably acted somewhat as staging post or entrepôts, amongst others in Baltic amber.

3 THE HERO WARRIOR – AN (OUT)DATED OR A BINDING ROLE MODEL IN THE 7TH C. BC?

Author(s): Metzner-Nebelsick, Carola (Inst fuer Vor- und Fruehgeschichtliche Archaeologie, Provinzialroem Archeologie; LMU Munich)

Presentation Format: Oral

In the 7th century BC larger parts of southern central Europe form part of the Hallstatt culture in its western and eastern specification. Our notion of this period in southern central Europe is still dominated by the impressive grave inventories in large barrow cemeteries. At least this visualisation of power is not matched by likewise impressive settlement structures in the western Hallstatt sphere. This may in part be the case for taphonomic reasons, but may also reflect a significant shift in social organisation where – at least in Bavaria – former settlement centres of power seem to have been abandoned. The new Hallstatt habitus of the 7th c. BC in the western Hallstatt world is very much a personalised one, staging a revival of behavioural patterns of the 13th and 12th c. BC in a sepulchral context. Possibly mythological narratives were instrumentalised by certain families to legitimize their newly gained or emerging status among older power structures. Or, indeed 'old' families re-vitalised the role of the Late Bronze Age wagon-driving, sword bearing warrior to demonstrate their ancestry and thus social predominance. In the eastern Hallstatt world this type of creating ancestry lines took different shapes. The talk will explore the diverging patterns of social competition within the 7th c. BC in both regions and ask if ideologically the 7th c. BC is an innovative or rather a traditional period.

4 MITTERKIRCHEN: A PLACE OF SPACIAL AND SOCIAL INTERACTION IN CENTRAL EUROPE'S EARLY IRON AGE

Author(s): Schumann, Robert (University of Hamburg, Archaeological Institute)

Presentation Format: Oral

The Mitterkirchen cemetery (ca. 800– 650 BCE) is, besides Hallstatt itself, one of the best-known Early Iron Age sites in western Austria thanks to its outstanding sumptuous burials and complete excavation in the 1980s. The burial rituals and the composition of the grave goods allow a unique opportunity to evaluate Mitterkirchen in the context of the long discussed societal developments in the Early Iron Age of Central Europe. Furthermore, Mitterkirchen is situated on the crossroads between what is classically defined as the western and eastern Hallstatt circles as well on the trade routes of salt from Hallstatt. As such, Mitterkirchen was embedded in several interaction networks that extended way beyond the direct surroundings. The burial rituals indicate that the Mitterkirchen burials specifically emphasize more western aspects, which in combination with the topographical situation creates a clear ideological border situation. In this paper, I will therefore evaluate the burial rituals from a supraregional perspective and discuss how societal developments, ideologies, borders and interactions across these are reflected and reinforced in the funerary rituals in Mitterkirchen.

5 IRON AND SALT – THE ROLE OF BURGSTALLKOGEL NEAR GROSSKLEIN IN THE DISTRIBUTION AND COMMUNICATION NETWORKS OF THE SOUTH-EASTERN ALPS

Author(s): Mele, Marko - Hellmuth Kramberger, Anja - Modl, Daniel (Universalmuseum Joanneum)

Presentation Format: Oral

With the emerging Iron Age the relatively small flat peak called Burgstallkogel in the hinterland of the Mura river valley has risen to one of the most prominent Hallstatt period sites of the south-eastern Alps. The dominating position over the Sulm and Saggau valleys within a closed micro-region with easy controllable accesses seems to be one of the crucial factors for the development of the settlement and the vast tumulus cemeteries known today as the Sulm-valley cultural group.

In the year 2017 the Universalmuseum Joanneum started the EU-project Iron-Age-Danube, which is financed by the Interreg Danube Transnational Programme. The project enabled us to look beyond the site of Burgstallkogel and its tumulus cemeteries at the micro-region of Sulm and Saggau valleys and try to understand the landscape dynamics in the Early Iron Age. One of the major questions of the research was, how did the inhabitants of the settlement on the Burgstallkogel understood, used and controlled the space and the resources.

Many of the processes observed on micro-level give interesting hints on how the Hallstatt period networks functioned in the south-eastern Alps. Styria lies on the major route from the salt mines of Hallstatt to the Pannonian plain and was additionally rich with iron. Perfect circumstances for the creation of networks, which created high value for its owners. The first look on the region shows, that we have to think about major centres, like Burgstallkogel near Großklein and Falkenberg above Strettweg, and a whole series of smaller settlements with different roles, as e.g. for up-keeping the distribution network. The questions, which we would like to address in our paper are, how did this network function, how far did the influence area of major centres in the south-eastern Alps reach and how can this be observed in the archaeological record.

6 EMERGING NEW CULTURAL ENTITIES IN THE 7TH CENTURY BC SOUTH OF CARPATHIANS. FERIGILE GROUP AND “THE WHITE GOLD”

Author(s): Mandescu, Dragos (Arges County Museum)

Presentation Format: Oral

The paper focuses on the sudden emergence of the cultural group Ferigile in the mid-7th c. BC, in a formerly blank area, where there was nothing before during the Early Iron Age (southern sub-Carpathian hills of Oltenia and Muntenia - southern Romania). The group's settlements, fortresses and other forms of habitat are unknown, but the incineration necropolises debuts in the 7th c. with rich and prestigious burials, with spectacular assemblages of adornments, weapons and harnesses belonging to some previously less or un-known forms (except ceramics), highlighting complex links with other milieux from Balkans and Eastern Europe. The best example is the eponymous necropolis at Ferigile composed by 150 barrows evolving for almost two and a half centuries. In absentia of the habitat structures, the necropolis from Ferigile reflects the mirrored image of a true node of power in the area. The emergence of Ferigile occurs on the background of the dissolution and vanishing of Basarabi cultural phenomenon. The predilectional zone of expression, and even the landscape of the two cultures differ fundamentally and do not overlap, which may imply the adoption of special economic patterns and the referencing to different cultural networks. The poor representation of Ferigile settlements in the main spreading area, apparently in contrast to the large number of cemeteries, seems to suggest some relatively mobile communities having an economy based on livestock farming but also on a new vision of valuing the natural resources. So, not at all by accident, the most expressive monuments of Ferigile group (the elites' graves) overlap some of the most important salt deposits in the southern sub-Carpathians. The paper emphasizes the role played by Ferigile communities dealing with these salt deposits (a resource that has been continuously exploited throughout all ages afterwards) and the newly-established communication and exchange networks.

7 ON POTTERY BY WOMEN FOR WOMEN, THE EMERGENCE OF FIGURATIVE ART IN 7TH CENTURY CENTRAL EUROPE

Author(s): Nebelsick, Louis D. (Unwersytet Kardynala Stefana Wyszynskiego w Warszawie)

Presentation Format: Oral

Hubs of the 7th century are usually imagined as being created and maintained by men. As far as the formulation and distribution of figurative art are concerned, nothing could be further from the truth. When contexts of Central European Hallstatt period figurative art and patterns of its production and use are analysed a surprisingly clear and dynamic picture of gender roles in the invention, production and utilisation of figuratively decorated artefacts emerge. At the beginning of the 7th c. BC. women on the northwestern fringes of the Alps (Kalenderberg Group) decorated symposial vessels in female denoted graves with figural motives using a schematized formulae illustrating female denoted hierarchical compositions but also narrative themes. By the century's close, the context of figurative art production moves from east to west and from pottery vessels to woman's dress accessories. Beginning in the innovative hub of the Hallstatt salt mining site male jewellers in the western Hallstatt sphere began using motifs and compositions derived from the Kalenderberg area to decorate bronze costume accessories which would figurate the bodies of their female patrons. In this paper, I will explore the mechanisms of engendered communication, which are likely to have included the exchange of figured textiles, that lie behind this remarkable development.

8 7TH CENTURY BC IN THE GOLDEN VALLEY – PRINCES OF THE CROSSROADS

Author(s): Potrebica, Hrvoje (Dept of archaeology)

Presentation Format: Oral

The earliest traces of the Hallstatt communities in this area belong to the 8th century BC. However, the 7th century BC is the time when these communities reach the highest peak of development. This sudden rise of power of local elites is directly connected to the fact that they were immersed in a new communication network that is now established across Europe from Baltic to Mediterranean. The Iron Age communities of the Požega Valley were deeply rooted in Eastern Hallstatt Cultural Circle and well-connected with neighbouring areas in the south-eastern Alps and southern Pannonia. However, already the first finds from Kaptol princely graves suggested that it had strong ties with the south, particularly with northern Bosnia. Numerous items discovered in the Požega Valley were here at their farthest points of distribution within Europe, and those include various types of weapons, elements of attire and other special-use items. Since elites of individual communities are those who are running and regulating this communication network, it is primarily reflected in their rich burials, which included some exclusive and prestigious objects brought from far-away places. Kaptol in particular but other sites as well (Kagovac and others) was, over a long period, a very important hub in the Early Iron Age communication network which linked the developed cultural and production centres of Greece and Italy with rich centres of Hallstatt communities in Central Europe. The close ties between this centre and Iron Age groups south of the Sava River (such as Donja Dolina and Glasinac), in the eastern Alpine region (Lower Carniola and Styria), and in the Danube region and Transdanubia, confirm that Golden Valley had a crucial position at the cross-roads between three cultural spheres: Pannonia, the Alps and the Balkans.

9 GLASINAC – EMERGENCE OF POWER REFLECTED IN BURIAL LANDSCAPES

Author(s): Pravidur, Andrijana (National Museum of Bosnia and Herzegovina)

Presentation Format: Oral

The seventh century BC in the Early Iron Age cultural groups in Bosnia and Herzegovina is primarily marked by rich burials which reflect emergence of local but powerful elites. These exceptional graves appear when the Early Iron Age burial ritual is already established as something conceptually different from the Bronze Age burial practice. They suggest rather sudden social differentiation and emergence of powerful elites which are sometimes to easily described as aristocracy. This is especially visible at Glasinac. It is region located in the eastern part of Bosnia and Herzegovina, extending from the Romanija Mountain in the west to the Drina River in the east. The name of Glasinac in archaeology usually refers to groups of tumuli necropolises created in that area in Bronze and Iron Age. It is also considered to be core area of a much larger cultural complex that in the Early Iron Age stretched over large area of Central Balkans. The larger area of Glasinac complex and even more specific core area of Glasinac in Bosnia and Herzegovina covers extremely important communication routes between different cultural Iron Age regions of this part of Europe. Especially important contacts were established to the production centers of the Mediterranean world. All this probably enabled flourishing of Glasinac communities in the seventh century BC which is primarily reflected in content of elite burials. It was definitely turning point when this area became power centre in this area of Balkans with large influence of neighbouring areas and well connected with Greek and Italian world. Since we know very little of their settlements, changes in social structure and material culture are best reflected in grave content texts. Tumuli necropolises of that period also create extraordinary burial landscapes, unique in this part of Europe.

10 THE BASARABI PERIOD AND ITS CHRONOLOGY BASED ON THE RECENT DISCOVERIES AND DATA FROM TARTARIA - PODU TARTARIEI VEST

Author(s): BORS, Corina Ioana (National History Museum of Romania - MNIR)

Presentation Format: Oral

For quite a while the Mures valley, in central Transylvania, was considered like a northern border as concerns the so-called the Basarabi phenomenon / pottery style, which characterises the Middle Hallstatt period. But recently, about 6 years ago, throughout a large scale rescue excavation followed by a scheduled multidisciplinary research project, the newly discovered site from Tartaria - Podu Tartariei vest (Alba county) provided substantial discoveries and data which change the perspective for this epoch, in terms of chronology, characteristic features and long-distance exchange (towards East, on the North Pontic areas, but also to the Western Balkans). Given the topics announced for the session, the paper will discuss the new 14C obtained on a series of samples from this site, as well as certain important contexts, assemblages and artefacts, but also the general characteristics of this site, most probable a centre of power during the 9th to the 7th centuries BC.

11 EARLY SCYTHIAN CENTRES OF POWER IN THE PONTIC FOREST-STEPPE

Author(s): Makhortykh, Sergey (Institute of Archaeology Ukrainian Academy of Sciences, Kiev)

Presentation Format: Oral

In the VII century BC, in particular its final period, new power centers arise in the Pontic forest-steppe. This place is one of major areas of concentration of the early Scythian sites in the south of Eastern Europe. A group of the so-called "royal" burial mounds emerges here; these kurgans are distinguished by their large height (i.e. 7-20 meters) and can be viewed as symbols of power. The spatial distribution of these tumuli suggests that several nomadic power centers existed in the forest-steppe Ukraine. One of these centers was located on the right bank of Dnieper in the Kyiv-Cherkasy region, where the largest burial mounds of the

archaic period (e.g. Glevaha (8.7 m), Perepyatiha (11 m) were found.

Even larger elite kurgans of the early Scythian epoch were discovered on the left bank of Dnieper in the forest-steppe areas. These burial mounds are mostly concentrated in the Sula river basin. Their height varies from 7-8,5 up to 19-20 m (Starshaya Mogila, kurgans 10, 11, 14 from Aksyutintsy, etc.).

The emergence of the "royal" Scythian tumuli marks the peak of power of the Scythians related to their return to Eastern Europe following the end of Near Eastern military campaigns. The phenomenon of Scythians is related not only to their economic and social specificity, but also to their role as a connecting link between different cultures and areas.

12 URBANISM, HISTORY, AND LOCALITY IN THE PONTIC FOREST-STEPPE DURING THE IRON AGE, CA. 700 - 300 BC

Author(s): Johnson, James (University of Wyoming)

Presentation Format: Oral

The Pontic Iron Age is primarily characterized, if not dominated, by the arrival of nomadic pastoralists, conventionally known as the Scythians. Much of the archaeological and historical research done on these group(s) focus on burial rites and the deposition of large quantities of gold, silver, and other luxury items, including foreign exotics, in burials. This may be due to Herodotus' lengthy and detailed description of a royal Scythian funeral. Yet, Herodotus also indicated vibrant socio-economic goings-on in the forest-steppe, exemplified by his brief discussion of Gelonus. Along these lines, this paper explores and assesses the construction of large fortified population centers along the forest-steppe/steppe boundary in present day Ukraine as specific localized developments that ultimately come to participate in an inter-regional trade and symbolic network. As an example, the eventual development of the large fortifications at Bel'sk (Gelonus?), an approximately 4000-5000 hectare settlement and mortuary complex, is the central focus leading to pressing questions, including: how did forest-steppe communities respond to the socio-economic opportunities presented by the arrival of Greek colonies along the Black Sea littoral around 700/650BCE? How did these same communities react to the presence of the (sometimes) militant Scythian tribes in the steppe south of the forest-steppe boundary? What did these reactions/responses mean for community cohesion and the growth of large, possibly urban, population centers along the forest-steppe boundary? This paper traces the emergence, development, and abandonment of these large forest-steppe centers with regards to the presence of the Scythians in the Pontic region, ca. 700 - 300 BC.

284 UNTANGLING THE FINAL PALAEOLITHIC AND EARLY MESOLITHIC IN EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Zander, Annabell (University of York) - Berg-Hansen, Inger Marie (Museum of Cultural History, University of Oslo) - Nielsen, Ebbe (University of Bern) - Sørensen, Mikkel (University of Copenhagen)

Format: Regular session

The last Ice Age came to an end 11,500 years ago when rapid climate warming of c. 5-10°C occurred within decades radically transforming Europe's environment. This change in the landscape had a significant impact on the fauna and, of course, on humans. From early on, the Pleistocene-Holocene transition was used to define the beginning of the Mesolithic and, based on typology, several archaeological traditions or groups were constructed. Shifting between different theoretical approaches during the 20th century, research largely focused on economic adaptation, technology and settlement history. In recent years the increase of data and the application of new methods allow a renewed discussion of the 10th millennium BCE. Among the new proposals is the result of recent research showing that the climatic changes do not necessarily align to cultural changes.

However, it remains debated how various traditions/groups relate to each other. Thus, untangling this complex web of archaeological traditions at the Pleistocene-Holocene interface in Europe will be the main focus of this session. We seek to question the division between Palaeolithic and Mesolithic archaeology based on various case studies from across Europe, with particular interest in papers addressing several traditions from one region in terms of interrelatedness. We also welcome papers which address methodological or theoretical aspects, such as a pan-European terminology. Through a discussion of these problems we hope to offer a broader European perspective on the relationship between the various archaeological traditions at the Palaeolithic-Mesolithic interface thereby inspiring new thoughts on human responses to the Holocene climatic change. Questions we wish to address are:

- How can different Final Palaeolithic and Early Mesolithic traditions be defined and how do these differ on a regional/European scale?
- How do different regions relate culturally during the 10th millennium BC?
- How can we define the "Final Palaeolithic" as opposed to the "Early Mesolithic"?

ABSTRACTS

- 1** **MANAGEMENT AND DETERMINATION OF LITHIC RAW MATERIALS IN THE ARCHAEOLOGICAL SEQUENCE OF EL CIERRO CAVE (RIBADESELLA, ASTURIAS, SPAIN)**
Author(s): Martín Jarque, Sergio (Universidad de Salamanca) - Tarriño, Antonio (Centro Nacional de Investigación sobre la Evolución Humana) - Bécares, Julián (Universidad de Salamanca) - Jordá-Pardo, Jesús F. (Universidad Nacional de Educación a Distancia) - Álvarez-Fernández, Esteban (Universidad de Salamanca)
Presentation Format: Oral

El Cierro Cave (Fresnu, Ribadesella, Asturias) is located at the mouth of the Sella River. It was discovered at the end of the fifties of the last century and studied by F. Jordá Cerdá between 1958 and 1959, by this researcher and A. Gómez Fuentes between 1977 and 1979, and by E. Álvarez Fernández in 2016. The study of the archaeological materials recovered in the last two mentioned interventions, together with the dating of more than thirty samples using the Carbon-14 method, has allowed specifying the occupations that took place in the cave between ca. 45,000-9,000 cal BP. In the different archaeological levels dating from the Mousterian to the Mesolithic, including the Aurignacian, the Gravettian, the Solutrean, the Magdalenian and the Azilian, highlights the great abundance of remains of biotic and abiotic origin. This poster presents the first results of the analysis of lithic raw materials in general for the complete archaeological sequence and the flint in particular for the levels dating from the Lower Magdalenian and the Upper Solutrean. The classification of the lithic pieces has been based on their external textural characters, for which we have used a reference collection. For the determination of flint, samples have been selected for study through a binocular loupe and thin films. The lithic raw materials collected in the immediate environment of the site are predominant, among which stand out the quartzite, the radiolarite and the so-called black chert. Also there are different types of flint, both from Asturias (Piloña, Piedramuelle) and from distant (Monte Picota, in Cantabria) and very distant supply sources (Flysch, in the Basque Country).
- 2** **ANALYSING NETWORKS TO STUDY CULTURAL TRANSMISSION PROCESSES FROM THE UPPER MAGDALENIAN TO THE LATE MESOLITHIC IN IBERIA**
Author(s): Cucart-Mora, Carolina - Gómez Puche, Magdalena - Romano, Valeria - Lozano, Sergi - Fernández López de Pablo, Javier (Institut Català de Paleoeologia Humana y Evolució Social - IPHES; Universitat Rovira i Virgili)
Presentation Format: Oral

Social networks are a well-established concept in Palaeolithic Archaeology to interpret different degrees of regional and interregional interactions among hunter-gatherer populations. However, the heuristic power of the networks approach has been traditionally biased towards its social dimension, empirically grounded in the reconstruction of exchange systems using ornaments and lithic raw materials. Much less attention has been paid to the use of networks approaches to study diachronic patterns of cultural transmission and their demographic context. In this contribution, we present aspects of a long-term research programme in the context of the PALEODEM project (ERC-CoG-2015 Ref. 683018), aimed to study cultural transmission processes from the Upper Magdalenian to the Late Mesolithic in Iberia using formal network approaches and computational methods. In particular, the work presented here is concerned with the construction of a new georeferenced database of archaeological sites and cultural attributes which will be used to build spatio-temporal networks. Three categories of artefacts-ornaments, bone and antler projectiles (harpoons, points and sagaies) and lithic projectiles- have been systematically recorded using bibliographic sources. The final database compiles the archaeological record from more than 300 Iberian sites.

By constructing and analyzing spatial networks from these robust empirical data, we aim to contribute to the research topic of the spatial organization of hunter-gatherer groups into regional social networks and its influence on cultural change.
- 3** **AT THE MEETING POINT OF INFLUENCES: FINAL PALAEOOLITHIC AND EARLY MESOLITHIC IN HUNGARY**
Author(s): Faragó, Norbert - Mester, Zsolt - Király, Attila (Institute of Archaeological Sciences, Eötvös Loránd University) - Kertész, Róbert (Damjanich János Museum) - Péntek, Attila (-) - Kraus, Dávid (Budapest Historical Museum Aquincum Museum and Archaeological Park) - Szegedi, Kristóf István (Várkapitányság Integrált Területfejlesztési Központ Nonprofit Zrt.) - Novothny, Ágnes - Magyar, Enikő (Institute of Geography and Earth Sciences, Eötvös Loránd University)
Presentation Format: Oral

Due to its geographical context, the Middle Danube basin or Carpathian basin is a meeting point of climatic, biogeographical, as well as cultural areas. Crossing the basin the Danube River links together the Balkans and Central Europe providing a north-west southeast migration route for animal and human populations. On the other hand, the basin is connected with the northern and eastern plains by mountainous passes and river valleys across the Carpathians. The environmental conditions of the basin developed under the effects of three climatic belts: oceanic from the west, continental from the east, submediterranean from the south. The archaeological record of Hungarian sites, dated to the period of the Final Pleistocene and Early Holocene, demonstrates cultural influences coming from these directions too. We deal with this problem by investigating four excavated sites representing different regions within the basin: Szekszárd-Palánk (south) and Sződliget (north) in the Danube valley, Páli-Dombok (northwest) in the Rába valley, Jászberény (northeast) in the Zagyva valley. Szekszárd and Páli are dated to the Final Pleistocene, Sződliget and Jászberény to the Early Holocene. The environmental context, lithic typology and technology and raw material

economy are considered using the results of new analyses as well as the revision of published analytical data.

The "Lithic resource management dynamics from the Middle Palaeolithic to the Middle Neolithic in northern Hungary" project is financed by the NRD Fund (grant no. K124334).

4 **A PLEISTOCENE-HOLOCENE TRANSITIONAL INDUSTRY FROM THE BLÄTTERHÖHLE ROCK SHELTER (HAGEN, WESTPHALIA)**

Author(s): Orschiedt, Jörg (Curt-Engelhorn-Zentrum Archäometrie gGmbH; Freie Universität Berlin) - Heuschen, Wolfgang (Ruhr-Universität Bochum) - Baales, Michael (LWL-Archäologie)

Presentation Format: Oral

The Blätterhöhle cave, discovered in 2004 is noted for Early Mesolithic (9200 - 8700 cal BC) and Late Neolithic (3900-2900 cal BC) human remains and palaeogenetic evidence for Late Neolithic societies based on differing economic strategies. Since 2006 excavations take place within the cave and in a small area of a collapsed rock shelter. Here, for the first time in this region, a unique Mesolithic stratigraphy was uncovered. In 2016 the first Late Palaeolithic artefacts and faunal remains in a stratigraphic context were found. Among the lithics a few larger blades and several backed monopoints are striking. Partially backed points sometimes showing a bent tip are present as well as straight-backed or curved-backed points and small or elongated examples. Of special interest is a slender tanged point.

This assemblage is highly comparable to the French Épi-Laborien dating to the Pleistocene-Holocene transitional period around 9650 cal BC. The slender and straight backed points called pointes des Blanchères and trapezes are common but so far missing at the Blätterhöhle. Very similar is the high variability of backed points in the Blätterhöhle and French assemblages and "degenerated" tanged points, both present in the French Épi-Laborien as well. By now the Blätterhöhle lithic assemblage is the most eastern proof of distinct typo-technological influence by the French Épi-Laborien.

5 **FLINT KNAPPING AT THE END OF AN ERA. FINAL PALAEOOLITHIC AND EARLY MESOLITHIC TECHNOLOGICAL TRADITIONS IN NORTHWESTERN BELGIUM**

Author(s): Vandendriessche, Hans - Crombé, Philippe (University of Ghent)

Presentation Format: Oral

Our current knowledge on the Lateglacial and Early Holocene technological traditions in Northwestern Belgium relies primarily on quantitative data (attribute analysis) gathered in the past two decades on the Lower Scheldt valley sites of Verrebroek and Doel. This allowed us to forge a first idea of the range of knapping methods and techniques applied during this transitional period and at the same time to link the observed technological schemes to the known typological variability in this region. As part of an ongoing PhD research, the recently excavated Upper Scheldt valley sites of Ruien (Final-Palaeolithic) and Kerkhove (Early-Mesolithic) are added to this equation, in order to assess and expand the still rather limited knowledge on the matter. However within the current research, a twofold methodology is adopted: in addition to a detailed attribute analysis, the abovementioned sites are also subjected to a refit study, thus providing us with both quantitative aggregate level data (at the scale of an artefact cluster) and data at the level of a single refit sequence.

Although preliminary results indicate that technological traditions at the start of the Younger Dryas do not differ substantially from those of the Early Holocene, the first refitted sequences from Kerkhove already seem to depict a much greater variability in the knapping methods adopted by the hunter-gatherers at the site, than is generally acknowledged for this period.

6 **"LOST IN TRANSITION" – TRACING HUMAN RESPONSES TO CLIMATIC AND ENVIRONMENTAL CHANGE IN THE PLEISTOCENE-HOLOCENE TRANSITION IN NORTH-WESTERN EUROPE**

Author(s): Zander, Annabell (University of York)

Presentation Format: Oral

At the end of the last Ice Age at around 9600 BC rapid climate change of c. 5-10°C occurred within decades, followed by gradual warming over a 500 year period. This climatic transition has been used by archaeologists to divide the Stone Age into two separate periods: the Palaeolithic during the Ice Age and the Mesolithic following the climate change. Importantly, these changes have been attributed to Mesolithic hunter-gatherer groups migrating into regions that had previously been populated by Palaeolithic cultures. However: 1) recent research shows that cultural changes do not necessarily align to climatic changes, with Palaeolithic technology extending into the warming period; and 2) technological change is far from clear cut. Consequently, we need to re-examine this period.

This PhD project represents a diachronic cross-cultural comparative study of backed point, tanged point, long blade and Early Mesolithic traditions in northwestern Europe. In order to allow for such a detailed investigation a timeframe of 11,000-9,000 cal BC has been chosen which cuts across the various traditions. As part of this project more than 220 sites are recorded in a comprehensive database to assess how different traditions relate to each other and to analyse when and why humans did really change their lifeways. In order to better understand this complex interface, this thesis presents a novel holistic approach which investigates the various assemblages beyond detailed studies of lithic typologies. This holistic approach includes economic, social and ritual aspects of the lives of lateglacial and early postglacial hunter-gatherers thereby enabling a detailed reconstruction of developments and changes during the Pleistocene-Holocene interface.

7 FROM SEMI-CURATED TO EXPEDIENT? DIFFICULTIES IN IDENTIFYING THE TRANSITION FROM AHRENSBURGIAN TO THE EARLY MESOLITHIC IN NORTHERN GERMANY

Author(s): Grimm, Sonja - Groß, Daniel - Eriksen, Berit (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 "Scales of Transformation") - Hinrichs, Moiken (CAU Kiel, Institute of Pre- and Protohistoric Archaeology; CRC 1266 "Scales of Transformation") - Krüger, Sascha - Winkler, Katja - Weber, Mara-Julia (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 "Scales of Transformation")

Presentation Format: Oral

In northern Germany, the last Final Palaeolithic tradition is the Ahrensburgian and the Early Mesolithic of the region is generally associated with the Maglemosian technocomplex. The relation of the Ahrensburgian to the Early Mesolithic tradition in this region remains unclear as they display several similarities on a broad-scale such as the use of lithic blade techniques, microliths, and organic harpoons but differences in the details. Hence, although these technocomplexes are rather different, it is challenging to detect the exact turning point from one to the other. For instance, we can date single lines of evidence but brought together we need to raise the question: When has enough changed to make a change? One reason why this differentiation remains difficult may be that we often identify these technocomplexes in their most distinct versions, whereas the majority of our material is less distinctive and/or originates from potential palimpsests.

We assemble the different lines of palaeoenvironmental and archaeological evidence to show the relatively large margin and compare inventories from this transformation period using a quantitative as well as a qualitative approach to the northern German archaeological record. Based on this approach, we exemplify a broader behavioural change from a more curated to a more expedient behaviour that may be one of the reasons for our difficulties to untangle these interrelated traditions.

8 POINTS OR BLADES? VARIATIONS IN TYPOLOGICAL AND TECHNOLOGICAL ELEMENTS IN CHIPPED STONE ASSEMBLAGES 10 900-7000 CALBC, NW EUROPE

Author(s): Berg-Hansen, Inger Marie - Damlien, Hege (University of Oslo, Museum of Cultural History)

Presentation Format: Oral

We present a study of variability in morphological and metrical attributes of the projectile inventory from the Final Palaeolithic to the Middle Mesolithic (10 900-7000 BC) in Northwest Europe, and compare this with the simultaneous development in blade production methods. The study is based on technological and morphological analysis from 43 excavated sites in Norway, Sweden, Denmark and Northwest Germany.

Until recently, the Stone Age of Northwest Europe has mainly been investigated by using typological approaches to formal tool types. This has resulted in delimitation of a large number of regional archaeological groups. Projectile point typology has been central to this research. However, recent technological studies of lithic blade technology challenge this picture by demonstrating a shared and uninterrupted tradition of blade-making throughout the Final Palaeolithic and Early Mesolithic, indicating technological relatedness within large areas. Simultaneously we see alterations in technological elements such as projectile types which show a gradual increase in regional variability and reduced levels of standardisation. Further, after this long period of gradual development and relative technological continuity, abrupt and fundamental alterations are identified in the blade production methods and projectile inventory around 8300-8200 BC in parts of the area. We present new results from a statistical analysis of the projectile inventory, documenting a trajectory somewhat divergent from the development of blade production methods. Finally, we discuss how the two datasets combined can offer a new understanding of interaction dynamics and the culture-historical development of the Stone Age of Northwest Europe.

9 THE NEWEST LITHIC, BONE AND ANTLER MATERIAL AND ITS RESEARCH FROM THE EARLY HOLOCENE SITES OF COASTAL LITHUANIA

Author(s): Rimkus, Tomas (Klaipėda University, Institute of Baltic Region History and Archaeology)

Presentation Format: Oral

The area of coastal Lithuania contains several major country's rivers system, palaeolagoons and peat-bogs (part of them as former lakes), however this area is still lacking early Holocene sites and material from them, compared to the inland region. This situation was influenced by the quite complex geological development of the region due to the changes in the water level of the Baltic Sea in the early Holocene and the lack of field works. Nevertheless, most of the obtained material comes as the stray finds, found during drainage and peat exploitation works. On the other hand, in recent years, research with available archaeological material has intensified. More new excavations have been carried out, as well as revisions of the old collections at the museums. Technological analysis of articles was adapted to the bone and antler findings from the Late Mesolithic settlement of Smelte and the stray T-axe from the submerged Late Mesolithic settlement on the seabed near Melnragė beach (Klaipėda region). These are some of the findings that symbolize rich osseous industry and the mobile art in the coastal Lithuania during the Atlantic. One of the most important sites in this area is Aukštumala. It is located on the fluvioglacial island in the former lake, which is now transformed into a peat-bog. The newest excavation showed that the island contains three sites and all of them belongs to the leaf-shape points technology, better known as the Swiderian culture. Currently that is the most earliest known occupation in the current area of Lithuanian coast. The lithic assemblage contains typical Swiderian points, axes, scrapers and knives, also a big part of lithics assemblage comprises of non-flint material. For better understanding of sites economy and communities' relation to the wider region, use-wear and flint material chemical analysis were accomplished.

10 TRACING THE CHANGES: LATE PALAEOLITHIC AND EARLY MESOLITHIC LITHIC PROJECTILE POINTS IN LATVIA

Author(s): Kalnins, Marcis (Faculty of History and Philosophy, University of Latvia) - Zagorska, Ilga (Institute of Latvian History, University of Latvia)

Presentation Format: Oral

Projectile points, representing one of the most distinctive tool forms in lithic collections, can serve as an important diagnostic factor to determine the presence of a certain archaeological industry or culture in a region. Therefore, the goal of this paper is to present Late Palaeolithic and Early Mesolithic (11th – 9th millennium BC) lithic projectile points from present-day Latvia, focusing on both morphological and technological attributes as well as on dating problems.

It is possible to divide flint projectile points from Latvia (67 in total) into four main types, all produced from non-local, high-quality Cretaceous flint. Even though each type has its own specific characteristics, some of them share common technological attributes.

The first two types – tanged and willow-leaf points – are associated with the banks of two major rivers, the Daugava and Lielupe, representing the Swiderian technological tradition (Salaspils Laukskola and Avotiņi sites). Both tanged and willow-leaf points were produced from the same blank type. Based on similar material in the Baltic region, the tanged type is assigned to the Late Palaeolithic, while the willow-leaf type is dated to the end of the Late Palaeolithic and beginning of the Mesolithic. However, due to the lack of datable material on sites, it is not possible to determine the exact time these points were in use in present-day Latvia. Two other tanged point types – long, regular and smaller forms – are the Pulli types and have been found as stray finds in the River Daugava basin and at Early Mesolithic sites in NE (Zvejnieki II) and SE (Kvapani II) Latvia, dated to the 9th millennium BC. The use of smaller, less regular tanged points continued even later in the Mesolithic.

All the points from Latvia are analyzed in the context of all the Eastern Baltic traditions.

11 CULTURAL AND GENETIC DIVERSITY IN EARLY POSTGLACIAL SCANDINAVIA, CA.11,000–7500 BCE

Author(s): Knutsson, Kjell (Uppsala University Department of Archeology and Ancient History) - Damlien, Hege - Persson, Per Åke (Oslo University Museum of Cultural history) - Eymundsson, Carine (Oslo University Archaeology) - Murashkin, Anton (Saint-Petersburg State University Archaeology) - Roth Niemi, Anja (Tromsø University) - Manninen, Mikael (Helsinki University)

Presentation Format: Oral

For over a decade now, the field of paleogenomics has been a key source of information for studies of prehistoric human mobility and dispersal. Although the samples of ancient DNA in these studies derive from archaeological contexts, and interpretations of the sources of detected genomic variation are made using archaeological cultures as background information, due to variety of reasons archaeological discussion is rarely at the centre of papers that combine DNA and archaeology. With this in mind, we discuss the Early Mesolithic in Scandinavia, a case where cultural variability is great in the archaeological record but not necessarily fully grasped in studies that have attempted to combine genes and culture to create a model of early postglacial human dispersal.

A common problem for all DNA studies concentrating on Mesolithic north-western Europe, is that the currently available sample material postdates the archaeologically identified timing of the pioneer colonization process and many of the subsequent cultural processes that took place alongside and after the region had been occupied. In this presentation we present an up-to-date synthesis of available archaeological data from Fennoscandia predating 7500 cal BCE and discuss it in relation to the current model of single event gene-culture co-dispersal. We specifically scrutinize the idea that the eastern component detected in Mesolithic Scandinavian hunter-gatherers in studies of ancient DNA can be directly linked to a single population event evidenced by the spread of eastern pressure blade technology along the Norwegian Atlantic coast.

12 GENETICS OF MESOLITHIC HUNTER-GATHERERS IN SCANDINAVIA

Author(s): Persson, Per (Museum of Cultural History University of Oslo)

Presentation Format: Oral

Genome-wide aDNA sequences were obtained from three individuals from birch tar "chewing gums" dated to ca. 8200-7600 BC, originated from the Huseby Klev site on the Swedish west coast. They group together with earlier investigated Scandinavian Mesolithic individuals (Scandinavian hunter-gatherer, SHG), thereby enlarging the chronological and geographical extension of this group. The origin of the SHG genetic group is supposed to be an eastern admixture to an earlier western hunter-gatherer population (WHG) in Scandinavia. This Early Postglacial dual-route colonization of the Scandinavian Peninsula is largely based on dispersal of lithic technology from the East European Plain. According to this view the mixing should have taken place some 1000-500 years before 1000-500 years before the Huseby Klev individuals were living. Do the genetic results fit with this scenario?

Human DNA from mastics provides a clear connection between material culture and genetic data. DNA from different types of mastics can be used to study food-stuffs and oral microbiome of prehistoric populations.

- 13** **UNTANGLING COMPLEXITY IN EARLY MESOLITHIC MIGRATORY PATTERNS AND CULTURAL EXCHANGE - MERGING MATERIAL CULTURE AND BIOMOLECULAR STUDIES**
Author(s): Skar, Birgitte (NTNU University Museum)
Presentation Format: Oral
- Similarities in late-glacial lithic technology (direct blade percussion) of Western Europe and the oldest counterparts of Scandinavia appearing around 11,300 BP have sustained arguments for an early postglacial migration from northwestern Europe into Scandinavia including coastal areas of Northern Norway. However, another lithic technology (pressure blade), which occurred in Fennoscandia around 10,300 BP, indicates contacts with groups in the east and likely a second and this time east – west migration deriving from the Russian mainland.
- aDNA studies of the oldest coastal human individuals from Europe, represented by two southern Norwegian skeletons (9500 BP) unveiled admixture of southern hunter gatherer (SHG) and eastern hunter gatherer (EHG), descended from two isolated Glacial refugiums. The Norwegian samples show dominance of EHG while contemporary samples from Gotland show a dominance of SHG ancestry. Isotopic markers of a diet consisting of more than 80% marine protein deriving from the highest level of the food chain sustain the importance and likely attraction of marine mammal resources. The biomolecular results underpin a second migration into Norway from northeast ca. 10300 BP, likely over the Cap of the North and a continuation of a population flow and adaptation in the centuries to follow. Recent lithic studies based on radiocarbon dated samples covering larger parts of Central Scandinavia, however, provide a more fine-tuned narrative of networks and pulses of migration, and an entire substitution of technologies. While the northwestern Norwegian record, demonstrates an admixture of old and new technologies in the same short term contexts.
- 14** **THE TRANSITION TO THE MESOLITHIC IN SOUTHERN SCANDINAVIA**
Author(s): Sørensen, Mikkel (University of Copenhagen)
Presentation Format: Oral
- The transition to the Mesolithic in Southern Scandinavia is for many reasons a difficult question to handle: the definition of the Mesolithic is not clear, the radiocarbon dating of the Younger Dryas/Early Holocene is imprecise and the finds with stratigraphic and palynological evidence are few. In the paper it is argued, that: 1) The categorical definition of the Palaeolithic versus the Mesolithic is not feasible in order to characterize the social and cultural change during the period., 2) Several methodological perspectives needs to be applied on the period concerning e.g.; technology, typology, environment, geology, absolute dating, palynology., 3) A large Northwest European perspective needs to be applied.
- In light of these problems and methodological challenges it is argued that a relevant interpretation of cultural change in South Scandinavia during this period can concern two social traditions; the “Long Blade Complex” and the “Early Mesolithic”, both rooted in Late Palaeolithic/ Late Glacial Cultures. Moreover, that these two traditions partly are separated in time, regionalism and in their life style i.e., concerning economy and environmental adaptation. However, that their interrelatedness remains unclear.
- 15** **LIVE REINDEER-HUNTING CULTURES – INTERNAL ORGANISATION, TYPOLOGY/STYLE-DEVELOPMENT AND INTERACTION BETWEEN THEM**
Author(s): Grøn, Ole (Dept. of Geosciences and Natural Resource Management, Univ. of Copenhagen) - Klokkernes, Torunn (Culture&Preservation)
Presentation Format: Oral
- On the basis of fieldwork with the Evenk culture in Siberia and supplementing literature studies, some general features of such cultures will be outlined. Generally, there is a worrying difference between live reindeer-hunting cultures and the synthetic ‘culture constructs’ archaeological analysis is based on. One focus will be on the individual culture’s internal variation as well as unity with regard to typology, style, linguistic details, and taste down to the small-scale level in some cases within one household. Another focus will be on a central force behind this dynamic system which is the creation and maintenance of personal and group identity at all scale levels. A third focus will be on the interaction different groups from the clan level and up, including some territoriality issues such as changing clan-territories, strategies for collecting information about ‘foreign areas’, and the exploitation of new areas. One part of the explanation of the difference between archaeological and live reindeer-hunting cultures can be that ephemeral materials (skin, fur, bark, wood, bone, etc.) are preferred for dynamic social signaling as opposed to the generally well-preserved lithics which are much more difficult to vary.
- 16** **CLIODYNAMIC ARCHAEOLOGY: COMPUTATIONAL APPROACHES TO FINAL PALAEOOLITHIC/EARLIEST MESOLITHIC ARCHAEOLOGY AND CLIMATE CHANGE – A NEW ERC-FUNDED PROJECT**
Author(s): Riede, Felix (Department of Archaeology and Heritage Studies Aarhus University)
Presentation Format: Oral
- Late Pleistocene/early Holocene Europe is said to be the ideal laboratory for the investigation of human responses to rapidly changing climates and environments, migration and adaptation. Yet, pinpointing precisely how and why contemporaneous Final Palaeolithic/earliest Mesolithic (15,000-11,000 years BP) foragers migrated, and which environmental or other factors they adapted to – or failed to – has remained remarkably elusive. The European Research council recently decided to fund CLIOARCH, a 5-year project focused on this period. At the core of CLIOARCH is the radical but, in light of research-historical insights, neces-

sary hypothesis that much of the current archaeological cultural taxonomy for this period is epistemologically flawed and that interpretations based on this traditional taxonomy – especially those that seek to relate observed changes in material culture and land-use to contemporaneous climatic and environmental changes – are therefore problematic. Hence, novel approaches to crafting the taxonomic building blocks are required, as are novel analyses of human-environment relations in this period. CLIO-ARCH's aim is to provide operational cultural taxonomies for the Final Palaeolithic/earliest Mesolithic of Europe and to couple these with interdisciplinary cultural evolutionary, quantitative ecological methods and field archaeological investigations beyond the state-of-the-art, so as to better capture such adaptations – almost certainly with major implications for the standard culture-historical narrative relating to this period. In so doing, the project will pioneer a fully transparent and replicable – and eminently transferable – methodology for the study of the impacts, or lack thereof, of climate change and extreme environmental events in prehistory.

17 **BLADELET PRODUCTION AND MICROLITH TYPOLOGY DURING LATE PLEISTOCENE IN PORTUGAL: AN UPDATE**

Author(s): Gameiro, Cristina (UNIARQ - Centro de Arqueologia da Universidade de Lisboa)

Presentation Format: Oral

In Portugal, the Late Pleistocene industries, traditionally assigned to the Magdalenian technocomplex, are characterized by profuse bladelet production and a huge variety of microlith types. Those have been conventionally used to establish the chronocultural sequence and are usually perceived not only as cultural markers but also as a source to understand adaptive strategies. Previous works showed that the same debitage strategies were used during a long diachrony and usually the different microlith typology resulted from blank transformation by retouch. The regional variability has been explained by an adaptation of local groups to different raw material environments. Using a new grid analysis (combining morphology, metric, technic and functional analysis), gathering data from recently excavated sites and comparing the identified cultural phases with climate changes we will revise information on the Late Pleistocene in the western façade of Iberia producing an updated synthesis on the lithic tool kits used by the last Pleistocene hunter-gatherers.

A. **CHERT PROCUREMENT AND CULTURAL AFFILIATION OF THE FINAL PALAEOLITHIC AND MESOLITHIC OF CENTRAL SWITZERLAND**

Author(s): Nielsen, Ebbe (University of Bern) - Affolter, Jehanne (Private lab)

Presentation Format: Poster

The chert of a small number of assemblages of the Final Palaeolithic and Early Mesolithic has been analyzed by a geologist. The stone material could thus be attributed to specific outcrops. There seem to be differences between the Palaeolithic and Mesolithic procurement strategy.

Main source is the southern hill foot of the Jura Mountains, mainly the areas of Olten and Lägeren. Oltenm seem to be the main source during the Mesolithic, Lägeren during the Final Palaeolithic. Contact to the Alpine Area are shown by rock Crystal, to the western part of Austria through the presence of radiolarite from the Klein- and Grosswalsertal-vallies. The chert present originating from the Southern Alps and Western Switzerland, as well.

Typological Analysis Show a cultural Group in the Swiss Plateau, in the Early Mesolithic the Groups seem to be more local restricted. All sites of the Final Paleolithic yielded more than 50% burins. Typical of the Early Mesolithic is the dominance of oblique retouched points.

286 **BLADES STILL A BIG DEAL? – LAMINAR TECHNOLOGY IN THE MIDDLE PALAEOLITHIC AND MIDDLE STONE AGE**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Carmignani, Leonardo (Department of World Archeology, Human Origin Group, Leiden University; UMR 7041, Équipe AnTET, Université Paris Ouest Nanterre La Défense) - Schmid, Viola (Department of Early Prehistory and Quaternary Ecology, Eberhard Karls Universität Tübingen; UMR 7041, Équipe AnTET, Université Paris Ouest Nanterre La Défense)

Format: Regular session

Since the eye-opening paper 'The Big Deal about Blades: Laminar Technologies and Human Evolution' by Bar-Yosef and Kuhn in 1999, it has become clear that considering blade technology as exclusively associated with Upper Palaeolithic industries does not reflect the archaeological reality. More recently, research has shown that laminar production appears as early as the Middle Pleistocene in Africa as well as Eurasia, and is definitely a well-integrated part of technical systems in the Middle Palaeolithic (MP) and Middle Stone Age (MSA). However, the nature, variability and mechanisms behind the emergence of early laminar technologies remain still poorly understood.

In this session, we examine the present state of our understanding of the cross-continental blade phenomenon in the MP and MSA. We aim to tackle research questions about the different contexts in which this particular technological choice occurs and under what circumstances. Does blade technology in the Near-East, Africa and Europe follow the same evolutionary pattern? Does the advent of laminar production reflect technological convergence or can common drivers explain its appearance in different areas and in different time periods? What dynamics fostered the invention, implementation and diffusion? To what extent

did social factors have an impact on the variable expressions of blade reduction systems? What were the laminar end-products used for?

The aim of manufacturing elongated objects can be associated with different reasons which cannot be condensed into one single explanation. Furthermore, the adoption of a new concept, in this case the production of blades, has direct implications for the technical system and social organisation. We are convinced that a session including multiple detailed technological analyses and integrating a broad temporal and spatial set of archaeological case studies can address these questions to significantly advance our understanding of the rise and importance of blade technology in the MP and MSA.

ABSTRACTS

1 LATE LOWER PALEOLITHIC BLADES PRODUCTION AND USE: A SUMMARY FROM ACHEULO-YABRUDIAN QESEM CAVE, ISRAEL

Author(s): Lemorini, Cristina - Cristiani, Emanuela (Sapienza University of Rome) - Nunziante Cesaro, Stella (SMATCH, Rome) - Venditti, Flavia (TAU Tel Aviv University) - Zupancich, Andrea (Sapienza University of Rome) - Barkai, Ran - Gopher, Avi (TAU Tel Aviv University)

Presentation Format: Oral

We present an overview on blade production and use at Late Lower Pleistocene Qesem Cave (Israel) based on the integration of technological and functional (use-wear and residues) analyses applied to lithic blades.

Qesem Cave is a Middle Pleistocene site dated to 420,000-200,000 years ago and assigned to the Acheulo-Yabrudian Cultural Complex. Amongst the wealth of innovative behaviours, Qesem Cave yielded evidence of large scale, systematic, serial blade production and blade tool shaping throughout the 11 meters stratigraphic sequence. The blades reflect strict standards of raw material selection and an established and crystallized *Chaîne Opératoire* for blade production, shaping, use and discard. Qesem Cave blade knappers developed a very efficient blade technology, with relatively little effort invested in core preparation and maintenance, simple at first glance, but actually sophisticated and highly effective.

At Qesem Cave blades and naturally backed knives (NBKs) were used, in many cases, unshaped and without a haft. The principal action carried out with these blades/tools was cutting a range of materials of soft to medium consistency. Blades and NBKs were used especially for processing hunted prey. Nevertheless, in the area of the central (300 ky old) fireplace, although butchering is, as always central, additional materials comprising dry hide, herbaceous plants, tubers and wood were worked by blades.

Qesem Cave blades were multi-purpose adaptable tools mostly used in cutting, butchering and defleshing activities on soft tissues and were practically in some way conceived as disposable tools – cut and throw-away implements. Blades at Qesem Cave may thus be viewed as usable blanks accommodated for a daily “situation” rather than functionally specialized tools. In a way this may imply expediency – at least as far as use (in dealing with prey) goes, and in this respect, no big deal, yet the technology was not expedient at all.

2 BLADES IN RETROSPECT- THE CONTRIBUTION OF ABU SIF TO THE UNDERSTANDING OF THE TECHNOLOGICAL ORGANIZATION IN THE EARLY MIDDLE PALAEOLITHIC

Author(s): Wojtczak, Dorota (IPAS, Basel University) - Malinsky-Buller, Ariel (MONREPOS, Archaeological Research Centre and Museum for Human Behavioural Evolution)

Presentation Format: Oral

The Early Middle Palaeolithic (EMP) in the Levant presents a unique phenomenon, diverse modes of blade production dominate the technological organization. Unlike the previous and later appearance of blade production, an intermittent innovation throughout Eurasia and Europe; between 250 and 160 ka ago within a confined geographical boundary of the Levant, blades and their by-products were the main “behavioural package.” The EMP lithic assemblages comprised of several techno-typological traits, the use of Levallois, laminar and cores on flakes reductions. Furthermore, it seems that within each single reduction sequence, there is versatility and changes between technological concepts arise, allowing prolongation of the core’s utility, thus an enhanced control of blank production.

Here, we reintroduce the assemblages from Abu Sif excavated in 1935, the first EMP site excavated and analysed. These lithic assemblages, despite biased collection methods, will contribute to the understanding of the EMP technological organisation. Those results highlight the techno-typological diversity in the mode of production, yet reflect the narrow variation that is shared with all known EMP sites. The possible social and demographic implications of this low-diversity within a cohesive geographical and chronological framework will be discussed within the previous Late Lower and later Middle Paleolithic record of the Levant. Additionally, a less intensive occupation during the EMP than the preceding epoch provides an alternative indication of discontinuity between these periods. There is no evidence of dramatic ecological or climatic changes in Levant during the transition period which could relate to either the extinction of an entire meta-population or support the flow of new people. Furthermore, these transitions seem to be relatively quick, chronologically. The relationship between demographical and ecological dynamics seems responsible for changes within local technological and behavioural patterns. Yet, complexities arise when incorporating the regional dynamics into long-term evolutionary scenarios.

3 HEIDENSCHMIEDE – FIRST EVIDENCE OF SYSTEMATIC BLADE PRODUCTION IN THE MIDDLE PALEOLITHIC OF THE SWABIAN JURA

Author(s): Cep, Berrin (University of Tübingen)

Presentation Format: Oral

Heidenschmiede is a rockshelter in Heidenheim at the Brenz river, in the eastern part of the Swabian Jura. The site was originally discovered and excavated by the amateur researcher. Due to a disturbance by a medieval wall and the insufficient excavation methods, the site is unstratified. The following excavator Eduard Peters classified the finds as belonging to the Acheulian and the Mousterian, with some pieces being of microlithic character. According to later researchers only the Middle Paleolithic is documented at the site.

Since the archaeological remains have never been completely analyzed, the fauna and the lithic material of the Heidenschmiede are currently being re-evaluated by S. Münzel and by the author herself.

The assemblage shows a wide range of Middle Paleolithic tools, including various scraper types, several bifacial and unifacial tools such as handaxes, Keilmesser and points, as well as some so called “Groszaki”.

The non-bifacial technological strategies are represented by several Levallois flake and blade cores as well as by non-Levallois blades and cores. The length-width ratios indicate that elongated flakes and blades are an important component of the assemblage. This is unique for the Swabian Jura.

14 C-Dates from three bone samples are at the limit of radiocarbon dating and therefore probably indicate the late Middle Paleolithic origin of the finds. This is in line with the techno-typological features at that time in the cave sites of the Swabian Jura and in the neighboring regions such as the adjacent Franconian Jura.

It can be noted that an extensive non-Levallois blade technology in the Swabian Jura is proven for the first time at the Heidenschmiede.

4 MIDDLE PALEOLITHIC BLADES VS. INITIAL UPPER PALEOLITHIC LAMINAR TECHNOLOGY IN EASTERN CENTRAL ASIA

Author(s): Khatsenovich, Arina - Rybin, Evgeny (Institute of Archaeology and Ethnography SB RAS)

Presentation Format: Oral

The appearance of large-blade bidirectional production is associated with a significant event known as the Initial Upper Paleolithic in eastern Central Asia, marked not only by critical changes in lithic technology, but by specific tool assemblages as well. This event was so distinct from both ancestral and descendant technocomplexes, that it presupposes the in-migration of a population or populations bearing this technology into eastern Central Asia, including Mongolia, eastern Kazakhstan, Xinjiang and the Transbaikalian region of Siberia, probably from the Russian Altai Mountains. Blades were intensively used as tool blanks, having already appeared in local Terminal Middle Paleolithic industries in some of these regions, especially Mongolia. Levallois point production, well-developed at this stage, required preparation of the flaking surfaces of cores by removing marginal blades, thus, in this case, blades were generated as a secondary product. There is some limited evidence of targeted blade production in Terminal Middle Paleolithic assemblages along with Levallois technology. The Terminal MP falls between >50,000–43,000 ya and is partially overlapped by an IUP presence in eastern Central Asia from 45,000–37,000 ya. Considering Terminal MP complexes with Levallois technology and blades as distinct from IUP complexes, we suggest the existence of, minimally, two blade production traditions. From this point of view, IUP laminar technology was “intrusive” into eastern Central Asia. Considering the origin of blades in eastern Central Asia, we not only raise technological questions, but also make preliminary inferences regarding the anthropological context of those technologies’ bearers.

5 BLADE TECHNOLOGY OF THE D-A LAYERS FROM SIBUDU, SOUTH AFRICA, WITHIN THE CONTEXT OF MIS 5 IN SOUTHERN AFRICA

Author(s): Schmid, Viola (Department of Early Prehistory and Quaternary Ecology, Eberhard Karls Universität Tübingen; UMR 7041, Equipe AnTET, Université Paris Ouest Nanterre La Défense)

Presentation Format: Oral

Stone Age research has for a long time neglected the Middle Stone Age (MSA) of MIS 5 due to the scarcity of well-dated and well-documented sites and the focus on the purportedly exceptionally innovative Still Bay and Howiesons Poort techno-complexes. However in recent years, a shift becomes noticeable, as more and more archaeological data are acquired illustrating the uniqueness and inventiveness of the MSA during MIS 5. One striking adoption as an integral component within the toolkits of this time period stands out, namely blade technology, though the mechanisms behind the appearance of this phenomenon remain so far poorly understood. Current excavations at Sibudu Cave in KwaZulu-Natal, South Africa, by the University of Tübingen have yielded MIS 5 lithic assemblages that contribute to the discussion about the significance and diversity of laminar reduction strategies during the MSA.

Following the chaîne opératoire approach, this paper presents a technological analysis of the lithic artefacts from layers D-A of the Deep Sounding at Sibudu. The knappers during this phase of occupation exploited a range of different raw materials to manufacture a variety of bifacial and unifacial points, including serrated pieces. Here I explain how the inhabitants of Sibudu focused on the production of laminar elements and developed a particular reduction strategy to obtain blades and elongated flakes.

These strata are characterized by unidirectionally knapped cores with a lateral crest opposite a wider, flat surface referred to as *méplat* or lateral plane that produces a triangular asymmetric volume for exploitation. The configuration of the cores facilitates the manufacture of laminar products with different intended morphological features. These results highlight the distinctive character of the laminar reduction system of the D-A layers of Sibudu and foster the discussion on the implications of this technological choice within the context of the southern African MSA.

6 THE CONTEXTUAL BLADE – TOWARDS A COMPARATIVE AND RADICALLY RELATIONAL UNDERSTANDING OF EARLY LAMINAR TECHNOLOGIES

Author(s): Hussain, Shumon (Faculty of Archaeology, Leiden University) - Schmid, Viola (Department for Early Prehistory and Quaternary Ecology, University of Tübingen; UMR 7041, Equipe AnTET, Université Paris Ouest Nanterre La Défense)

Presentation Format: Oral

In this paper, we suggest that the fundamental recognition of past research on blade technologies from the European Middle Palaeolithic and the African MSA (Middle Stone Age) is that they rarely occur independently of other reduction systems. If blade/let production dominates the assemblage, as for instance in the South African Howiesons Poort, this arguably represents an exceptional case. We contend that the effective understanding of the 'laminar phenomenon' is currently hampered by a prevailing blade fetishism – a latent aftereffect of the assumption that blades are inherently special. Instead, it is argued that the evolutionary significance of early blade technology is most likely tied to the emergence of internally differentiated – or highly 'textured' – lithic assemblages, in which varying reduction systems, including blade-bearing technologies, had the potential to complement and sustain each other. Blades, in other words, may have then fulfilled distinct and highly specialised techno-functional needs within particular technical worlds. In the words of economist and technological theorist W. Brian Arthur (2009), the variability of early laminar technologies might be elucidated as the result of the development of divergent 'opportunity niches'. It is this contextual role of laminar systems that has to be investigated in more detail if we wish to decipher the meaning of blades in hominin evolution. We briefly illustrate this emerging viewpoint and draw out some of its interpretive implications by mustering a small number of examples from the South African MSA and the European Middle Palaeolithic.

References

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A. FROM THE EAST OR THE WEST? BLADE PRODUCTION IN THE LEVANT AND NORTHWEST OF EUROPE DURING THE MIDDLE PLEISTOCENE

Author(s): Al Najjar, Mustafa - Wojtczak, Dorota

Presentation Format: Poster

The blades production is a turning point in the lithic record and reflects development of technological capabilities of Paleolithic humans. Many results from many sites throughout Levant and Europe showed that they were rich in blades.

A systematic production of blades appeared in the Levant during the transition from the Lower to Middle Paleolithic. Two distinct blade industries were distinguished in the LLP, Pre-Aurignacian and Amudian were first recognized at Yabrud I and Tabun cave. These blade industries have been associated with term Acheluo-Yabrudian and dated back to between 400.000 – 200.000. Many more sites have been found to contain both in their stratigraphies. The subsequent EMP industries also contained a systematic production of blades. In spite of the differing names; Hummalian, Abou Sif, or Tabun D. The EMP blade productions showed many similarities in technological and typological characteristics and dated to around 200.000.

In the northwest of Europe, development skills and new technological features emerged during the shifting from the Lower Paleolithic to the Middle Paleolithic. Predetermined flaking systems and more complex core reduction strategies increased during Middle Paleolithic e.g. the laminar, Levallois productions and many other. The oldest laminar production in the northwest of Europe dated back to the Early Middle Paleolithic roughly between 300 to 250.000 that corresponds to the MIS8 and 7. Many sites showed substantial numbers of laminar elements e.g. Saint-Valery-sur-Somme, Baker's Hole, Rissori, Rheindahlen, Tourville-la-Rivière, Veldwezelt-Hezerwater. etc.

The time frame relating to the emergence of blades in the Levant and the northwest of Europe and their techno-typological pattern shows different characteristics. In this poster, the comparison of the emergence of blades in the Levant and in the northwest of Europe will allow us to gain a better understanding of the blade productions of the Middle Pleistocene and discuss variability during this period.

287 ARCHAEOLOGY IN SCHOOLS. INTERNATIONAL APPROACHES IN COMPARISON

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Mathis, Christian (Zurich University of Teacher Education) - Egea Vivancos, Alejandro - Arias Ferrer, Laura (University of Murcia) - Pinto, Helena (University of Porto)

Format: Regular session

Despite the fact that archaeologists have tried to offer students the perspective that archaeology is everywhere, traditionally, the material sources have been seen as most useful teaching material to «illustrate» the historical content instead of being introduced as sources to be analysed.

Visiting an archaeological site or museum has been regarded as an act of perception and reception of information in order to enhance students' motivation. The students' agency in this kind of learning process is usually quite low.

However, in the last decade this view has been challenged. It is argued that the introduction of archaeological methodology in formal educational settings proves to be a valuable and effective resource for historical learning. Furthermore, it allows to implement enquiry based strategies to teaching and learning as well as understanding the importance of preserving archaeological heritage by means of assessing its value as a source of knowledge.

This session will deal with approaches from different countries on how to integrate archaeology and its methodology together with material culture into classroom practices. There will also be a focus on the process of reconstruction: from the prospection, to finds, to sources, to interpretations, and presentations in a narrative. This includes formal teaching at archaeological sites.

We invite contributions which discuss how to incorporate archaeological methodology, sites, monuments, and artefacts as well as the importance of cultural heritage for society into the history classroom.

ABSTRACTS

1 **ARCHAEOLOGY IN THE CLASSROOM. MATERIAL CULTURE AND ARCHAEOLOGICAL METHOD IN THE HISTORY TEACHING PROCESS AND HERITAGE INTRODUCTION**

Author(s): Arias-Ferrer, Laura - Egea-Vivancos, Alejandro (University of Murcia)

Presentation Format: Oral

The research presented in this paper is based on a longitudinal study (2012 to present) of an archeological experience in a Secondary School in the city of Cartagena (Spain), with the aim of designing instructional experiences that include secondary students as active agents in historical discourse. As part of the recreation of an archaeological site, investigators designed and developed a sequence of interdisciplinary activities intended to introduce students to archaeological concepts, competencies and skills. Further, the program involved the development of educational objectives and contents not only related to the social sciences, but also integrated across a wide range of disciplines.

The introduction of direct work with archaeological evidence resulted in the improvement of the teaching-learning process, especially in relation to history. The drastic transformation of in-class history lessons to an outside-laboratory where the students search, classify, analyze, reflect and interpret information from found objects supported the development of historical thinking skills. Further, as students worked with small artifacts representative of personal stories and global history, they expressed interest in and increased their awareness of issues related to cultural heritage. Objects turned into small pieces of history that students perceived as worthy of preservation. They came to describe such objects as having intrinsic value and their sense of the worth of such objects grew over the course of their study.

In comparing results with similar initiatives at different educational levels and in different contexts, developed with more complexity and infrastructures or with scarce resources, the introduction of the archaeological methodology in educational settings proved a valuable and effective resource, not only in supporting students' historical study, but in helping them contemplate their roles as citizens.

2 **“WILL WE EVER GET TO DO THIS AGAIN?” EARLY ADOLESCENTS USING ARCHAEOLOGY TO INVESTIGATE THE LIVES OF THE WORKING POOR**

Author(s): Henderson, A Gwynn (Kentucky Archaeological Survey) - Levstik, Linda (University of Kentucky)

Presentation Format: Oral

The research presented in this paper focuses on one aspect of a larger study investigating the impact of archaeological study on fifth-seventh grade students living in four rural, high poverty communities in and adjacent to the Appalachia region of Kentucky. Study participants included students participating in an archaeology program focused on investigating the lives of the working poor in a racially integrated neighborhood. Investigators administered pre- and post-unit surveys of student interest in and knowledge about archaeology, history, and inquiry, observed selected class sessions and conducted small group (2-3 students) interviews that were analyzed using a grounded theory model, searching for patterns and discrepant cases within and across data sets.

The proposed presentation focuses specifically on students' responses to an elicitation task that required students to select data to include in a documentary about the community of shotgun houses that formed the basis for their study. Students had access to archaeological data, historical documents and oral histories of the people who had lived in this neighborhood.

In grappling with the task of selecting elements of a documentary, students considered the constraints on human agency, the impact of poverty, and the richness of lives lived amidst serious difficulties but also in close communities. In doing so, their responses suggest affordances and constraints related to archaeology-based inquiry into civic issues—in this case issues of eminent domain, relocation, community preservation and economic trade-offs. Interviews also make clear the challenges facing students whose experiences may be limited as much by a lack of prior instruction using archaeological and historical evidence, as by roadblocks related to their own economic status. Further, interviews reveal students' insights into the human costs of wealth and highlight the ways in which archaeological and historical study provide constructive outlets for the expression of

such insights.

3 HERITAGE AND HISTORY EDUCATION THROUGH ARCHAEOLOGY: INFERRING FROM OBJECTS

Author(s): Pinto, Helena (CITCEM, University of Porto)

Presentation Format: Oral

Observing objects in a museum or in a historic site can be an interesting and outstanding educational experience to stimulate students' historical thinking through the interpretation of sources related to various aspects of the life of a human community in the past. Concurrently, if the sensory manipulation and exploration of objects, and specifically the archaeological ones, can be provided, value-added strategies may allow students to have experience enriching learning. Concerning this starting point, the research question that guided the study here presented was: How do seventh grade students make historical sense of replicas of archaeological objects of the Roman era? Grounded on an essentially qualitative research, this study focused on the perspectives of the participants both with respect to the uses and to the meanings of the archaeological objects for them and for the communities that made and handled those objects. The study was carried out in the history classroom, with about eighty students of compulsory secondary education (seventh grade) in the north of Portugal. Results from data analysis of students' answers to a set of questions specifically designed to evaluate students' interpretations, revealed that archaeological objects can be interesting and thought-provoking sources to interpret the past. Several students revealed to interpret sources, making inferences based on previous knowledge and making conjectures about social, economic or cultural aspects. The study highlights that manipulation and sensory exploration of objects, and specifically archaeological objects, are strategies that allow memories to be activated and very fruitful learning experiences to take place. Furthermore, the use of replicas in the classroom stimulates students' curiosity and encourages a visit to the museum or to the interpretive centre where real archaeological objects are exhibited.

4 PROJECT ARCHAEOLOGY: INVESTIGATING HOUSING AS A CIVIC ISSUE

Author(s): Henderson, A Gwynn - Stottman, M. (Kentucky Archaeological Survey)

Presentation Format: Oral

The entanglement of humans and objects challenges educators to think more carefully about what educational frameworks might help students recognize the interplay of human intelligence, ingenuity, innovation, and agency. This is particularly crucial with respect to protecting archaeological sites that serve as primary data for studying past peoples, especially in pre-literate societies. Such understanding is also central to informed civic decision-making, a broad goal of public schooling as well as the guiding purpose of social studies education.

The authors developed and piloted an instructional unit focused on how shotgun houses could illuminate the lives of the working poor in an historically integrated community. The unit was developed as part of Project Archaeology: Investigating Shelter, a national, inquiry-based curriculum that emphasizes archaeological questions, sources and investigatory techniques to support a preservation ethic. Studies suggest that archaeological inquiry enhances students' ability and/or inclination to analyze the connections between human intelligence, innovation, agency and related civic behaviors.

This study took place in four rural Kentucky Appalachian counties. Each county had experienced serious instances of archaeological site destruction. Both of these factors highlight the increasing body of research indicating that school community influences how subject matter is taught and learned.

Investigators developed the shotgun shelter unit in collaboration with teachers who piloted it in grades five-seven. The presentation follows the four teachers as they adapt the unit to their instructional settings and analyze the unit's effectiveness in their classrooms. Analysis of teacher surveys, individual teacher interviews, and full group interviews suggests that implementing and sustaining inquiry-based instruction was challenging in regard to sustaining focus on the guiding questions and that the civic implications of students' investigations were more often overlooked than any other part of the inquiry. Interviews with teachers provide insights into contextual factors that influenced how teachers implemented a new curriculum.

5 LEARNING IN A MUSEUM OF ARCHAEOLOGY: A STUDY WITH SECONDARY STUDENTS

Author(s): Pinto, Helena (CITCEM, University of Porto) - Silva, Sofia (AXIS MUNDI - Heritage & Archaeology)

Presentation Format: Oral

We all relate to objects and learn through experiencing through them. The tangibility of the material nature of objects makes them adequate from the educational point of view, both in the formal and non-formal spheres. We can relate the characteristics of the object with more general concepts, and reach conclusions about the historical, social and cultural context in which it was made and used. The exploratory study here reported, of a qualitative nature, has been carried out with a group of ±15-year-old students of secondary education, participating in a hands-on activity and a planned visit to the Museum of Archaeology D. Diogo de Sousa, Braga, Northern Portugal. The research focused on the interpretation of archaeological artefacts by a specific audience – secondary education students – aiming at understanding how a hands-on activity with archaeological artefacts may develop students' skills to interpret objects displayed in a museum exhibition. Students were invited to participate in a hands-on-activity, previous to a planned visit to the museum, and they were asked to select three objects from a cluster of displayed artefacts, and share their views, ideas, and thoughts about them, when responding to a set of questions. Data analysis has been revealing that most of participants' answers exceeded the simple observation of the object, and in some cases have shown a

contextualized interpretation of the social and human relations established by the communities of the past and the present. Likewise, interpreting artefacts may activate students' personal memories and identity connections with their own and other communities.

6 EXCURSION INTO THE PAST: LEARNING AT ARCHAEOLOGICAL SITES

Author(s): Mathis, Christian (Zurich University of Teacher Education)

Presentation Format: Oral

Archaeological sites such as the medieval ruins above the village make traces of history in one's surrounding area accessible and tangible. Their authenticity fascinates and motivates children to look and ask questions.

Furthermore, learning at archaeological sites leads pupils out into the landscape, where traces of human activity (e.g. parts of buildings, ruins, landscape transformations) have been preserved. These archaeological phenomena become pivotal points for the students' active engagement with the local space (e.g. perceive, describe, question etc.).

In addition, learning at archaeological sites is supported by the mandatory Swiss «curriculum 21» emphasizing historical, spatial and material perspectives on one's own environment already at primary school level (D-EDK 2016).

Moreover, learning at archaeological sites incorporates the principle of multi-perspectivity, which demands a discursive discussion of content and different perspectives on reality.

Thus, children learn to think academically, to discuss perspectives, explore and examine the world. Here, the pupils' learning processes are guided by learning task. They activate their knowledge and help to change, expand and enrich it (Mathis et al. 2017).

The paper is about a project on teaching materials for learning at archaeological sites in the students' local area. The focus is on «best practice»-task settings which, within the framework of the competence orientated teaching, lead to successful and lasting archaeological learning.

288 COMPARATIVE KINGSHIP: THE EARLY MEDIEVAL KINGDOMS OF NORTHERN BRITAIN AND IRELAND IN THEIR EUROPEAN CONTEXT

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Noble, Gordon (University of Aberdeen) - Gleeson, Patrick (Queen's University Belfast) - Jessen, Mads (National Museum Denmark)

Format: Regular session

The nature of the societies and social, ideological and political frameworks that filled the chasm left by the demise of the Roman Empire in the 5th century AD – both within and beyond the Empire's boundaries – is one of the most contentious debates about late- and post-Roman Europe. The Leverhulme funded Comparative Kingship project at the University of Aberdeen is addressing the nature of kingship and the character of seats of power within three case studies: Pictland, Scotland; Dál Riata, Ireland/Scotland and Muster, Ireland. The project is utilizing archaeological, historical, toponymic and palaeoenvironmental methodologies along with Bayesian-modelled chronologies, to study how these kingdoms took shape. To date the project has produced important new results on the emergence of Pictish power centres and society in the late Roman and early medieval period and is undertaking new survey work in Ireland on sites of royal power. Environmental data through pollen is also being produced to assess the impacts that royal sites had on the landscape and new Bayesian frameworks are being developed to assess the timings and tempos of social and political change.

In this session the Comparative Kingship project will present the early results of the project. As part of our comparative approach we invite colleagues to present studies from Europe that addresses the rise of late and post-Roman polities in the first millennium AD that showcase:

- The materiality and spatiality of power in the first millennium AD
- New archaeological data on first millennium AD seats of power
- How different data sources such as place-name studies and archaeology can be combined
- Critiques of, or models for, state formation
- The impact of new social and political formations on how the landscape and environment was utilised
- Trans-regional or trans-national studies comparing state formation processes.

ABSTRACTS

1 LOCAL COMMUNITIES AND THE RISE OF POLITIES IN THE TYNE-FORTH REGION

Author(s): Orsini, Celia (Durham University)

Presentation Format: Oral

Early medieval cemeteries have been described as central places where identities are developed, reassessed and reaffirmed. They have been the focus point of early medieval researchers for the past two decades, notably the large cremations cemeteries thought to have a large site-catchment and to serve multiple communities. However, in areas where the size of cemeteries is much smaller, the existence of small communities is not as easily inferred; Instead the excavation and analysis methods are

questioned. This paper aims to challenge the current framework and revisits the social organisation of the communities of the Tyne-Forth region between the 5th-8th centuries. Working with 90 site locations and 2434 burials, this research explores how people signalled their identity and their connection to places through their funerary practices and through the use of their surrounding landscapes. A comparative analysis of the funerary practices calls attention to the existence of highly varied practices, showing no sign of homogeneity throughout the selected timeframe despite the spread of Christianity and it is here interpreted as a localised expression of identity. Proximity and viewshed analysis complement the landscape study to stress the use of natural and built features and their visibility in localised area. Finally, the apparition of larger cemeteries around the 7th century is discussed, underlining the variability in the funerary practices within each site. Funerary arrangements are then compared and contrasted within the studied area and those of Southern Pictland and East Yorkshire in order to characterise the populations of the Tyne-Forth region in a wider British context. This paper argues for a social organisation in small to very small social groups through the 5th and the end of the 6th century and highlights a change in the social organisation during the 7th century, correlated to the spread of larger political entities in the region.

2 **TAKING A LINE FOR A WALKER: A NEW PICTISH SCULPTURE FROM TULLOCH, SCOTLAND AND THE IDEOLOGY OF KINGSHIP AND WARRIORS**

Author(s): Hall, Mark (Perth Museum)

Presentation Format: Oral

This talk will introduce a recently discovered Pictish sculptural find from Tulloch, Perth, Scotland (a chance discovery during road works). This rare example of an early Pictish figurative sculpture depicts a spear-bearing figure, which falls into a class of so-called ritual walkers. This new piece will be assessed against the broader group of such sculptures and more specifically against four key sculptures: Rhynie, Aberdeenshire; Newton of Collessie, Fife; Westerton, Angus and Kilmorack, Inverness-shire. These will be considered for the potential insights they offer into the warrior ideology underpinning and supporting early medieval kingship/leadership and the wider social hierarchy it was part of, which in part looked to spear-wielding deities/supernatural entities. Comparison will be drawn with contemporary and temporally distant parallels from Europe and the Near East (including Anglo-Saxon kingdoms, Scandinavia and Germany). Links with the monumental landscape and its territorial development will also be postulated to affirm the discussion around the social hierarchies of kings and warriors.

3 **COMPARATIVE POWER CENTRES: FORTIFYING RULERSHIP IN EARLY MEDIEVAL NORTHWEST EUROPE**

Author(s): Noble, Gordon (University of Aberdeen)

Presentation Format: Oral

This talk will summarize the progress to date of the Comparative Kingship project at the University of Aberdeen. The project is undertaking detailed study of three major polities: Pictland, Scotland; Dál Riata, Northern Ireland; and Munster, Ireland, with new survey and excavation projects being undertaken at major power centres in each case study. There are two major landscape studies in Pictland: Burghead and Rhynie, both in northern Scotland. Although undocumented, Burghead is the largest first millennium AD fortified settlement known in Scotland. However, the chronology of this fort is poorly understood and there has been limited work undertaken in the interior and on the environs of the site. Similarly, the unrecorded enclosure complex at Rhynie has recently been identified as an important Pictish power centre, and continued work in the environs of this complex has begun to contextualise the wider landscape of this 5th to 6th century power centre. In Northern Ireland, Dunserverick, a stunning promontory on the northern coast of Co. Antrim has been identified as one of the major royal seats of the Dál Riata dynasty. However, no modern excavation or survey work has been undertaken on the promontory. In Munster the Rock of Cashel was the centre of the Eóganachta. Recent survey at Cashel has revealed an extensive series of unrecorded archaeological features indicative of a vast complex in the immediate vicinity of the Rock of Cashel. The character of these new features suggests the location developed from a major fortified site during the 5th and 6th century AD, and was later transformed into a major ceremonial seat of kingship and of the early Church. The talk will outline our current understanding of each site and reflect on the ways in which we can begin to study these power centres on a comparative level.

4 **PEBBLES, POWER CENTRES AND POTENTATES: THE INTERACTION OF TEXTS AND ARCHAEOLOGY IN THE 'COMPARATIVE KINGSHIP' PROJECT**

Author(s): Evans, Nicholas (University of Aberdeen)

Presentation Format: Oral

Textual, 'historical' evidence has often been combined with archaeological evidence to shape our understanding of power centres and potentates, but the interaction between different disciplines is fraught with issues of interpretation. This paper introduces the historical dimension to the 'Comparative Kingship' project which focusses on studying contemporary documents, as well as analysing usually later place-names and territorial units, integrating this research with the project's archaeological and environmental aspects. I will consider debates about the nature of power centres in northern Britain and Ireland in the first millennium A.D., discussing examples of what connections can and cannot be made between written sources, such as Adomnán's 'Life of St Columba', and the archaeological evidence for the forms of hillforts and other elite sites, and for the social uses of such locations. The paper will also discuss whether the textual evidence supports current archaeological theories relating to a shift in the early medieval period from hillfort to undefended lowland, Christian ceremonial centres. I will argue that written evidence, if

investigated thoroughly, can provide valuable insights into the nature of power centres which can complement the work of other disciplines. However, it is also important to recognise the limitations of such text-based interpretations, in order to gain a healthy interaction between documentary and material culture approaches.

5 THE-EARLY-MEDIEVAL-KINGDOMS-OF-SCOTLAND: A PALAEOECOLOGICAL APPROACH TO UNDERSTANDING SOCIAL UPEAVALS AND POLITICAL TRANSITIONS BETWEEN THE 5TH AND 10TH CENTURIES AD

Author(s): Jones, Samantha (University of Aberdeen)

Presentation Format: Oral

Since Roman withdrawal from Britain in the late 5th century AD until the formation of Alba in the 9th-10th centuries AD, the early Medieval kingdoms of Scotland developed complex, highly stratified societies. A lack of integrated multidisciplinary studies however, means very little is known about these societies or how they functioned during social or political change.

As part of the Comparative Kingship Project, palaeoecological analysis (C14, pollen & geochemical) was completed from three locations close to archaeological sites spanning the early Medieval Period. Sites include 1) a valley fen at Rhynie in eastern Scotland close to a 5th-6th century Pictish enclosure and Pictish symbol stones. The enclosure doesn't appear to have been in use after the 6th century AD but little is known about the chronology of human activity in the wider landscape. 2) Loch of Leys crannog in eastern Scotland. The site was selected because excavations revealed phases of occupation during the late Roman Iron Age (1st-2nd centuries AD) and in the 9th-10th centuries AD. 3) A peat deposit on the island of Iona in western Scotland. The island is renowned for its early monastery founded in ~AD 563. The island also experienced Viking raids during the 8th-9th centuries AD and may have been influenced by later Norse settlement. A lack of historical records between the 8th to 11th centuries for Scotland, however, means our knowledge about societies living in Scotland during this period is severely limited. The main objectives of the palaeoecological analysis has therefore been to fill in some of these knowledge gaps and to gain a more robust understanding of the socio-political landscapes as the kingdoms of northern Britain and Ireland took shape. This paper presents, with the support of the available historical and archaeological resources, the preliminary findings from the three sites investigated so far.

6 MATERIALISING RULERSHIP IN FIRST-MILLENNIUM AD IRELAND: COMPARATIVE PERSPECTIVES ON THE POLITICAL RE-PRODUCTION

Author(s): Gleeson, Patrick (Queen's University Belfast)

Presentation Format: Oral

This paper explores the strategies of rulership employed by kings and related potentates in Munster, southern Ireland, during the first millennium AD, in order to examine the role of places in royal practices of governance and political reproduction. As the home of some of Ireland's most powerful kings and famous royal landscapes, Munster is a unique case study. Its capital at Cashel is iconic but unusual in an Irish context, and this paper explores its wider north European significance, while also analysing the role that Cashel and other royal centres played for framing competing political discourses at national and international level. Drawing on recent fieldwork at Cashel and other sites in Munster, it analyses the materiality and spatiality of power, authority, and rulership in late Roman to Viking Age European society. By exploring how programmes of construction and monumental investment were implicated in strategies of rulership, it examines the wider context of political discourse and its evolution as a critique of state formation frameworks in archaeology more generally.

7 THE LOST KINGDOMS OF THE POST-ROMAN NORTH CHANNEL

Author(s): Ó Riagáin, Russell (Heidelberg Centre for Transcultural Studies)

Presentation Format: Oral

Even though the historical data are often back-projected and unreliable and the associated archaeological evidence frustratingly low resolution, comparatively much can be said of the overkingdoms on either side of the body of water connecting the Irish Sea to the Atlantic Ocean. However, this paper intends to look beyond well-known groups such as the Dál Riata, Dál Fiatach and Dál nAraide to the polities they displaced or incorporated in the historiographical record, if not the landscape itself. To do so, the results of a long-term project that sought to refine settlement distributions in time and space in the North Channel in the Iron Age and medieval period using archaeological, textual and toponymic evidence will be employed. It will be demonstrated in this paper that the cloud of ink associated with the better-known overkingdoms obscures several other polities. A source-critical transdisciplinary approach makes it possible to identify information related to these 'lost' kingdoms and how they were later written out of the historical record and what traces they have left on the landscape. Understanding their form and obsolescence c.AD400-600 is key to understanding how the later state of affairs came about and might potentially provide a model for identifying other polities in Ireland, Britain and Continental Europe subsumed due to similar processes.

- 8 HOME OF KINGS – HOME OF GODS. HOW GUDME DEVELOPED AND MANIFESTED ITSELF IN THE LANDSCAPE PHYSICALLY, SOCIOECONOMICALLY AND SACRAL**
Author(s): Jessen, Mads (National Museum of Denmark) - Albris, Laurine (University of Bergen) - Rasmussen, Peter (National Museum of Denmark) - Nielsen, Anne Birgitte (Lund University)
Presentation Format: Oral
- The Danish place name Gudme means 'the home of the Gods' but why did this place get its name? In order to elucidate this question, we combine the Gudme (Funen, Denmark) area's place names with the area's landscape development (based on palynological data) and settlement history (based on archaeological data) during the first millennium AD. All archaeological find locations and relevant place names are collated in a data base and a recent pollen analysis from Lake Gudme shows the history of the landscape development. In the paper we argue that in order to obtain a deeper understanding of the sacral landscape a settlement-historical perspective must be established. In combining evidence of land-use, settlement history and place names, the paper discusses the background for the coining of the name Gudme. Together, the evidence provides important insights into the long-term development of Gudme both as a settlement area and as a concept.
- 9 COMPARING EARLY CHRISTIANITIES: THE TRANSFORMATION OF SACRED SPACE IN EARLY MEDIEVAL EUROPE**
Author(s): Busset, Anouk (University of Glasgow)
Presentation Format: Oral
- This paper focuses on a comparative approach to analyse the transformation of sacred spaces in early medieval north-western Europe. The twinned processes of Christianisation and institutionalisation of the Church drove a shift of power from the secular elites to the Church. Research on this topic has been constrained by analysis often conducted at a local or national level, leading to a strong understanding of local environments, but often forgetting transnational social, religious and political trends. Building on the analytical framework of comparisons created and successfully tested during my PhD research, the project presented here analyses data from geographical areas of north-western Europe which have not been looked at together before – namely Brittany, Scotland, Ireland and Scandinavia – to create and develop a narrative of the transformation of sacred places throughout the process of conversion to Christianity. To this end, the selected areas offer meaningful results, as they originate from widely different political, religious and social contexts.
- 10 EARLY MEDIEVAL ANIMAL ECONOMY IN NORTH-EAST SCOTLAND: A VIEW FROM THE PICTS**
Author(s): Masson-MacLean, Edouard - Britton, Kate - Czere, Orsolya - Fraser, Elizabeth - Fawcett, Jovita - Noble, Gordon (University of Aberdeen)
Presentation Format: Oral
- Significant gaps exist in our knowledge of the Picts, a cultural group that built the first kingdoms in eastern Scotland after the Roman period, due to the scarcity of historical sources and archaeological research, often limited to a few monastic sites. As a result, little is known of Pictish lifeways including human-animal relationships. Though previous studies of animal depictions on Pictish symbol stones have given some indication of the symbolic role of animals, their socio-economic value is generally poorly documented. However, recently excavated animal bone remains, from high status sites in NE Scotland investigated as part of the Comparative Kingship project, provide a unique opportunity to investigate the role of animals in Pictish society. Using a multidisciplinary approach combining zooarchaeology and stable isotopes, we present here new data on the exploitation and consumption of animals in Pictland. By bringing together this new data with existing datasets, this study produces a first regional synthesis, including a comparison between secular and religious sites, thus providing new insights into how these early kingdoms might have operated.
- 11 REFERENCING, RE-USING, REPURPOSING: EARLY MEDIEVAL ACTIVITY AT BRONZE AGE HILLFORTS IN IRELAND**
Author(s): O'Driscoll, James (University of Aberdeen)
Presentation Format: Oral
- In Ireland, small circular enclosures known as ringforts developed mostly in lowland areas or on the slopes of undulating productive farmland during the Early Medieval period. These enclosures, although abundant, are generally associated with average subsistence farmers, with a limited number of multivallate examples being linked with kings and other high status individuals. These ringforts, however, are not comparable, either in size, location or prominence, to their Bronze Age predecessors. How, therefore, can we explain and compare the disparity between the developing elite centres in Ireland with other parts of Europe during this period? This paper will attempt to coalesce, for the first time, the substantial evidence for the re-use and repurposing of Bronze Age hillforts in Ireland during the Early Medieval periods and place this phenomenon in its wider context. This is supported by reference to historical texts which infer that earlier hilltop fortifications were important mythological reference points for Early Medieval elites and used as 'media' to substantiate their access and rights to power, authority, land and goods.

Theme: Global change and archaeology

Organisers: Sørensen, Mikkel (University of Copenhagen, The Saxo Institute) - Groß, Daniel (Centre for Baltic and Scandinavian Archaeology) - Boethius, Adam (Lunds University)

Format: Regular session

This session address how we can preserve our origins for the future? Archaeological sites in Europe are today heavily affected by modern land use and climate change. As taphonomic processes are speeding up due to changing soil conditions, drainage, acidification, extensive use of wetlands for agriculture, forestry and expanding urbanization, the degradation of prehistoric sites and materials are intensified to a degree not seen before. This also means that the prerequisites for in situ preservation have changed significantly and that we today cannot be certain that even protected sites are not under intensified degradation. Questions about organic preservation have become even more pressing during recent years as advances in archaeo-science have progressed, demonstrating that organic residues and proteins of archaeological materials are immense resources of information about ourselves and our prehistory. The paradox is that the archaeological organic materials, which are now increasingly deteriorating, are the materials that we are in most need of in future studies of our prehistory.

In order to mitigate the destruction of in situ archaeological contexts and materials an important questions that we need to explore concerns how organic remains (artefacts, human waste and environmental indicators etc.) in different landscapes and environments currently are preserved. For example, what is the preservation today in rock shelters, in mineral soils, from wetland contexts and from submarine sites?

We find that there is need for a discussion about how archaeological sites best are preserved. The European legislations of archaeological heritage preservation are in this discussion also important to address.

There are no chronological or regional limitations for the presentations and the discussions in this session.

ABSTRACTS

1 WETLAND FUTURES IN CONTESTED ENVIRONMENTS: AN INTER- AND TRANSDISCIPLINARY APPROACH TO WETLAND HERITAGE IN THE NETHERLANDS, UNITED KINGDOM AND IRELAND

Author(s): Beek, Roy (Wageningen University & Research) - Jennings, Ben (Bradford University) - Gearey, Benjamin (University College Cork) - van Lanen, Rowin (Wageningen University) - Davies, Kim (University College Cork)

Presentation Format: Oral

Wetland environments are amongst the most dynamic landscapes in Europe, experiencing change from climatic, demographic, economic and political influences. They have also been an area of human utilisation for millennia, resulting in an incredible richness of material and immaterial heritage. Wetlands around the world are actively undergoing rapid change and development, but there are hardly any proactive studies to identify the impacts of change on cultural heritage. Additionally a wide diversity exists across stakeholders with respect to the ways wetlands are perceived and represented, but coherent dialogues are lacking.

In this contribution we present the outlines of a new European research project. This project focusses on key wetland environments in Ireland, the Netherlands and the United Kingdom to act as test cases for the identification of active and passive changes in those regions, and to identify ways in which the heritage of wetlands can contribute to contemporary social challenges. Through a combination of ethnographic survey, literature review, map regression analysis, remote survey and public and stakeholder interaction, the research will identify changing perceptions of wetland heritage, changing attitudes towards wetland utilization, and changing physical conditions within the environments which may influence the longer term survival of wetland heritage.

2 NEW WAYS OF FIGHTING EROSION IN A LAKESHORE SETTLEMENT

Author(s): Ramstein, Marianne (Archäologischer Dienst des Kantons Bern)

Presentation Format: Oral

The lakeshore settlement of Sutz Rütte lies on the southern shore of Lake Biene in the Canton of Berne. Since 2011, it belongs to the UNESCO world heritage "Pile Dwellings Around the Alps." An excellent example of a late Neolithic pile dwelling, it offers well-preserved archaeological layers containing organic material, including textiles.

Artificial lowering of the water level brought the submerged remains of the village into the erosion zone in the late 19th century. A pronounced decline of the extension of the archaeological site accompanied by a significant loss of organic matter became apparent during the last decades. Indirectly caused by human impact, the main problem is the erosion caused by waves during westerly storms.

The topographic cape situation open to the predominant wind direction renders traditional protection ineffective. Within years, the currents transported the gravel brought in as a test away from the site. An attempt to stabilise the situation with a wooden fence used in reed protection proved too weak to withstand the wave force.

The archaeological service of the Canton of Berne thus launched a project together with the EPFL of Lausanne to evaluate a more

durable solution. A detailed bathymetric model and a wave and current simulation allow us to understand the forces at work. In close collaboration with engineers and important players affected by the project, we developed a possible solution. The goal is to implement environmentally acceptable measures during the next years.

3 HANGING THERE – BUT FOR HOW LONG?

Author(s): Beck, Malene (Østfyns Museer)

Presentation Format: Oral

Coastal erosion due to climate change is an increasing problem in Denmark. According to the Danish Culture Agency in 2018, 711 scheduled monuments were located within 50 meters of the coastline and app. 92 were affected by erosion. A lot of the monuments probably contains very well preserved archaeological material and good opportunities exists to save important finds, gain new information and secure material for future research. But they are at the same time protected by law, and archaeological excavation is rarely permitted. It is possible to protect some of the monuments with different types of coastal protection. But how do we choose who's to live and who's to die? How do we get as much information for the archaeological record as possible, before the evidence is lost to the sea forever? In 2016 the Museums of Eastern Funen undertook an exploratory investigation of a Bronze Age barrow, which for the last century had been eroded by the sea. In 2014 parts of a full hilted bronze sword fell down on the beach and it became increasingly clear, that the barrow most likely wouldn't survive another decade. Looking at older maps and LIDAR-scans the erosion history was established. Approximately 50 percent of the barrow had already disappeared. The barrow was situated on a brink 11 meters above sea level and the situation demanded alternative methods and means of investigation. Taking advantage of the fact, that nature had already created a profile through the barrow an investigation involving hydraulic lifts with crawler feet was performed. A thorough photogrammetric registration of the barrow profile combined with micromorphological analyses and pollen analyses resulted in new insights in barrow building methods and in agricultural development in the region.

4 ORGANIC PRESERVATION IN ISOLATED SOFT-BOTTOM BAYS: A CASE FROM THE SKAGERRAK COAST, SOUTH NORWAY

Author(s): Nielsen, Svein (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

Wetlands make out c. 5 % (19 000 km²) of Norway's land surface, and about 7 % of the country's farmland area is defined as wetland. Even though the Norwegian government recognizes the importance of protecting wetlands to prevent greenhouse gas emissions, preservation of natural habitats and biodiversity, draining of wetlands for economic gain is still an option for Norwegian farmers. Due to few investigations of wetland sites in Norway, knowledge on the preservation of archaeological artefacts in the various types of wetland areas is poor. This paper presents the preliminary results from a recent investigation at the Jortveit farm, central Skagerrak Coast, south Norway. In 1931, the wetland area at Jortveit (35 ha) was drained by manual force, which led to the discovery of fish and whalebones as well as osseous artefacts at 1.7 m depth. In 2018, a selection of artefacts from Jortveit were AMS-dated to the 4th and 3rd mill. BC, and a small-scale investigation executed at the original find spot. The exceptional preservation conditions at Jortveit sheds new light on preservation conditions for organic artefacts in isolated soft-bottom bays in the Skagerrak area. Today, these are wetlands (incl. bogs) isolated from the sea as an effect of steady isostatic land uplift throughout the Holocene. Such sites challenges the day-to-day CHM practices in Norway, i.e. development led surveying and excavations.

5 THE „DUVENSEE MODEL“. ARCHAEOLOGICAL PERSPECTIVES ON A COMMUNITY MANAGED ANCIENT LAKE

Author(s): Groß, Daniel - Lübke, Harald (Centre For Baltic And Scandinavian Archaeology - ZBSA; CRC 1266: Scales of Transformation)

Presentation Format: Oral

Ancient Lake Duvensee in Northern Germany is one of the key regions for understanding early Mesolithic lifeways in Europe. Being in focus of archaeological research for almost 100 years, the peat bog yields several well preserved settlement sites from the Early and Middle Holocene and provided relevant insights into subsistence systems of Mesolithic people. But the area is not only relevant from an archaeological perspective, also ornithological interests are well represented as it is a relevant stop for migratory birds.

In this presentation we want to present how the archaeological research and preservation in Duvensee is handled and what role the local community plays in this. After a short discussion of reasons for the extraordinary preservation of the sites, we will discuss some implications for research at other sites and consequences for future preservation attempts. Also we want to critically compare the sites from Duvensee with other, less well-preserved sites and deriving consequences for research.

6 A STATUS ON THE MESOLITHIC PRESERVATION IN THE ÅMOSEN BOG, DENMARK

Author(s): Sørensen, Mikkel (University of Copenhagen)

Presentation Format: Oral

During the seasons 2017-18 the University of Copenhagen have conducted field archaeology in the Åmosen bog, Zealand (Den-

mark), in order to examine the preservation of earlier famously excavated Mesolithic contexts. Methodologies where coring, systematic field survey and test excavations are employed have been developed for the investigations. In general we see that the bog has dried out due to drainage and modern agriculture, with severe consequences for the preservation of the Mesolithic stratigraphies and for the organic artifact preservation. However, due to different environmental factors it has at few sites occasionally been possible to locate good preservation in the deepest Preboreal layers. In the paper the methodology applied, the environmental factors, the archaeological status and the Mesolithic potential of the Åmosen bog is discussed. It is concluded that we need to actively monitor and protect in situ mesolithic sites in wetlands if we are to preserve important information and bio-archaeological evidence of our Mesolithic ancestors.

7 FADING HERITAGE? INSIGHTS FROM THE 2019 EXCAVATION AT AGERÖD, SWEDEN

Author(s): Boethius, Adam (Lund University) - Magnell, Ola (Archaeologists, National Historical Museums) - Apel, Jan (Stockholm University) - Kjällquist, Mathilda (Archaeologists, National Historical Museums)

Presentation Format: Oral

The Ageröd peat bog site is one of the most famous Mesolithic settlements in Sweden. This is mostly due to the rich organic finds recovered here on excavations in the 1940s and 1970s. However, the organic remains stored at Lund Historical Museum show that the material excavated in the 1940s is in a better condition than the material from the 1970s. Furthermore, this pattern has also been observed to be a general occurrence on other archaeological sites. To elucidate what has happened with the organic remains during the last 40 years we conducted a small trial excavation in Ageröd with the purpose of investigating the organic deterioration at the site. Here we will present the results from this small trial excavation and link it to future possibilities and plans to deepen our understanding of the deterioration and degradation of organic remains at the most vulnerable archaeological sites in Sweden; The Stone Age sites.

290 LIVING ON THE WATER. THE PILE-DWELLING STRUCTURES BETWEEN HUMAN ACTIVITIES AND THE ENVIRONMENT

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Mangani, Claudia (Museo Civico Archeologico "Giovanni Rambotti", Desenzano del Garda - BS) - Schaeren, Gishan (Direktion des Innern des Kantons Zug Amt für Denkmalpflege und Archäologie, Zug) - Baioni, Marco (Museo Archeologico della Valle Sabbia, Gavardo - BS)

Format: Regular session

The structures of a settlement are always determined by the needs of a community and its strategies adaptive to the surrounding environment. This is particularly true for pile dwellings: wooden structures must adapt, often within the same settlement, to different environmental situations, which often change over time. The session aims to focus on the theme of settlement structures in a wet environment, trying to take stock of what we know about the features of these settlements, of what kind of studies have been undertaken to define the relationships between technical solutions and the surrounding environment. The general theme can be declined in different ways. Individual case studies can be presented, as well as regional frameworks or related to a specific chronological context. Analyses concerning a single structural element can also be presented also with a diachronic perspective. On the other hand, the theme can be tackled from the point of view of experimental archaeology and dealing with exemplary cases of reconstruction of pile dwellings with ancient techniques. Studies of the geoarchaeological approach, of sediment analysis underlying the raised structures and dendrotypological studies are welcome.

The session is part of the activities on the UNESCO site "Prehistoric Pile Dwellings around the Alps", but it is aimed at all possible structures of this type in the most various geographical and cultural areas.

ABSTRACTS

1 DENDROCHRONOLOGY, 14C AND ARCHITECTURAL FEATURES AT THE EARLY NEOLITHIC SITE OF LA DRAGA (BANYOLES, SPAIN)

Author(s): Piqué, Raquel (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Gassmann, Patrick (Independent Researcher) - López Bultó, Oriol - Bodganovic, Igor (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Palomo Pérez, Antoni (Museu d'Arqueologia de Catalunya) - Tarrus, Josep (Museu Arqueològic Comarcal de Banyoles) - Terradas, Xavier (Departament d'Arqueologia i Angropologia, Institució Milà i Fontanals, CSIC)

Presentation Format: Oral

The early Neolithic site of La Draga (Banyoles, Spain) is the only lake dwelling of Iberian Peninsula. The site is located at the shore of Lake Banyoles (Northeast of Iberia) and has provided evidence of two occupation phases. The oldest phase has been preserved in waterlogged conditions and has provided an important assemblage of wooden remains, among them more than one thousand piles and other architectural elements, while the second phase is characterized by stone pavements constructed of travertine and the absence of wooden remains. According the c14 dating La Draga was occupied uninterruptedly between 5361-5223 and 5000-4796 cal BC. In this paper are presented the results of the dendrochronological analysis of the piles and their relation with the phases of occupation identified according to the stratigraphy and radiocarbon dates. In addition, it is also

discussed the contribution of the dendrochronology for the characterization of the architecture of La Draga.

2 IT'S ALL WATER UNDER THE HOUSE? TRANSDISCIPLINARY EVALUATION OF A PROFILE SECTION FROM THE NEOLITHIC LAKESHORE SITE ZUG-RIEDMATT (SWITZERLAND)

Author(s): Ismail-Meyer, Kristin - Steiner, Bigna - Heitz-Weniger, Annikäthi - Schäfer, Marguerita (IPAS, University of Basel) - David, Sebag (University of Rouen) - Gross, Eda (Department of Monument Conservation and Archaeology of the Canton Zug; IPAS, University of Basel) - Schaeren, Gishan (Department of Monument Conservation and Archaeology of the Canton Zug) - Jacomet, Stefanie - Antolin, Ferran - Rentzel, Philippe (IPAS, University of Basel)

Presentation Format: Oral

The Neolithic lakeshore site Zug-Riedmatt was situated at lake Zug, in the delta of the river Lorze. It was settled between 3200-3100 cal BC and buried beneath 5 m of deltaic and limnic sediments, which led to an excellent preservation with organic deposits of up to 1.3 m of thickness.

The site formation processes were reconstructed by analysing the same samples of one profile sequence (spanning the whole occupation layer) by micromorphology, carpology, palynology, entomology and palynofacies analyses and combining the results in a microarchaeological, multi-proxy, transdisciplinary approach. Through this approach, it was possible to gain an understanding of the processes that led to the deposition of different sediments at the site and the factors that influenced them. The results of the different disciplines often matched. Influences of the river, the lake as well as a pond situation could be distinguished in varying degrees of intensity. Their complex interactions led to the deposit we find today and strongly influenced the life of the inhabitant of the site in the past.

We will present the most important natural and anthropogenic factors that influenced the formation of the deposits of this lakeshore settlement and show how the conditions at the site changed over time.

3 THE WOODEN ACCESSING AND ENCLOSING STRUCTURES OF THE NEOLITHIC LAKESIDE SETTLEMENT ANARGHIRI IXB IN AMINDEON BASIN (WESTERN MACEDONIA, GREECE)

Author(s): Giagkoulis, Tryfon (Institute of Archaeological Sciences, University of Bern)

Presentation Format: Oral

Anarghiri IXb is a prehistoric lakeside settlement with successive habitation layers dating from Late Neolithic I up to Early Bronze Age (late 6th- mid 3rd mil. BC) located in a plain that until the 1960's was the marshy northeastern shore of Lake Chimaditis in Amindeon Basin. The rescue excavation of the site lasted from 2013- 2017 and covered 12.000m² on the periphery of the settlement, as well as 8.000m² in the central habitation zone.

Apart from the numerous movable finds representing various aspects of the socio-economic and ideological activities of the Neolithic community, the dominant findings unearthed from the lowest anthropogenic layers were more than 3.500 wooden structural elements of various types. These constituted one rather typical prehistoric pile-field, whose analysis has led to the identification of some unique for Greek prehistory and quite early non-residential structures, namely three wooden trackways and parts of the settlement's enclosing works (fences). Their architectural form, their correlation to the neighboring activity areas and their possible function(s) at the margins of the occupation's main residential zone and beyond, are some of the issues to be discussed. Furthermore, some general conclusions regarding the settlement's layout will be drawn, together with the limitations to the interpretative approaches posed by stratigraphic complexities, discontinuities in spatial distribution of the material and depositional/post-depositional layers' formation processes detected in the archaeological record of Anarghiri IXb.

Moreover, the systematic examination of structural wood sampled during the last excavation's campaigns brings forth new alternatives for approaching research topics such as woodland and other resources management, as well as reconstruction of the habitation's micro-environment. Even more important are the potentials for the introduction of dendroarchaeology/dendrochronology as a state-of-art methodology in Greek, as well as southern Balkans' wetland archaeology.

4 PLANKS, BEAMS AND PILES: WOODEN STRUCTURAL ELEMENTS FROM LUCONE DI POLPENAZZE (BRESCIA, ITALY)

Author(s): Mangani, Claudia (Museo Civico Archeologico) - Baioni, Marco (Museo Archeologico della Valle Sabbia - Gavardo) - Martinelli, Nicoletta - Pignatelli, Olivia (Laboratorio Dendrodata - Verona)

Presentation Format: Oral

Lucone di Polpenazze is one of the small basins of the Garda morainic amphitheatre (BS-ITA). The site is a part of the transnational UNESCO site "Prehistoric Pile dwellings around the Alps".

The site, known locally since the XIXth century, was rediscovered in the 60s of the XXth century. Surface research has identified at least five different sites. Between 1965 and 1971 the site A was investigated. Site D, discovered in 1986, has been the subject of research undertaken since 2007 by the Museo della Valle Sabbia. The excavation campaigns permitted the investigation of an area covering 190 m² (Sector 1), with a recent enlargement of 153 m² (Sector 2) which is still in course of excavation. Lucone D was a smaller, shorter-lived settlement, compared with A site. The building construction episodes were dated through dendrochronology: felling dates were identified between 2034 and 1967 cal BC in the first part of the EBA-EBA1 in Italian Chronology). The first phase ended with a big fire that led to houses' collapse.

The particular situation determined by the fire and the general conditions of the site (a anoxic context with high humidity) allowed the preservation of many wooden elements both vertical and horizontal. They were subjected to wood and dendrochronological analyses that allowed their dating and the identification of the tree species used.

The study of all the elements allowed to recognize different types of wooden artefacts: deck planks, roof beams, probable parts of the walls. Particularly interesting are various types of beams with quadrangular holes, some probably pile-shoes, others are more difficult to interpret like the two long beams (8m) with 25 holes, found in the part of the settlement towards the lake. Purpose of this paper is to try to hypothesize the huts'shape and the use of individual wooden elements.

5 COMBINING DENDROCHRONOLOGY, GIS ANALYSIS AND RADIOCARBON: A NEW APPROACH FOR SPATIAL ELABORATION OF PILE-DWELLING STRUCTURES AT LUCONE DI POLPENAZZE (BS-ITALY)

Author(s): Baioni, Marco (Museo Archeologico della Valle Sabbia - Gavardo) - Martinelli, Nicoletta (Laboratorio Dendrodata, Verona) - Saletta, Emanuele (Professional Archaeologist) - Quirino, Tommaso (SABAP per la città metropolitana di Milano) - Capano, Manuela (CEREGE, Aix-Marseille University, CNRS, IRD, INRA, Collège de France, Technopôle de l'Arbois, Aix-en-Provence)

Presentation Format: Oral

Since the '980 dendrochronology proved to be an invaluable tool for the identification of wooden elements prepared at the same time, thus allowing to recognize the original structure of houses in the « fields of piles ». In Italy such a kind of study had a limited approach because of the restricted areas of excavations and the few numbers of samples analysed. The few exceptions are the sites of Bande di Cavriana, Sabbione and Bodio centrale. The research carried out at Lucone D since 2005, where around 400 wooden elements were dendrochronologically analyzed in an area of 190 m², highlighted a new kind of problem. Numerous felling episodes occurred frequently over time, at least 19 from 2034 to 1967 BC, many in the coming years. This situation makes the analysis of the planimetric distribution extremely difficult, since it is not possible to distinguish the main phases of the restructuring process. The suspicion that the practice of storage has been used arose too. Therefore only by combining dendrochronological dating and spatial analysis through GIS can the relationships between posts can be more easily found.

Moreover, more than 50 analyzed posts have not been dated because of their very short tree-ring sequences, from 15 to 35 years, which show more possible cross-dating positions against the mean curve. The possibility of identification of the right dating of these elements thanks to the wiggle-matching 14C dating would help archaeologists to identify the correct cross-dating and correlate them with already dated posts.

6 LAVAGNONE (DESENZANO – LONATO, BRESCIA). THE ONGOING RESEARCHES IN THE BRONZE AGE PILE-DWELLING

Author(s): Rapi, Marta (Università degli Studi di Milano)

Presentation Format: Oral

The stratified deposits of Lavagnone, one of the few long term pile dwelling settlements of the Garda region, constitute an archive that documents an interrupted sequence, from the Early Bronze Age up to the Recent Bronze Age.

Stratigraphic digs brought to light nine settlement phases, that show transformations occurred in the same cultural tradition (Polada culture in the Early Bronze Age, later on Palafitte and Terramare culture) and that can even be read in the light of men's relationship with the environment.

The excavation carried out in sector D involves a portion of the pile-dwelling settled during the Middle Bronze Age, of which remain some wooden vertical posts and, among them, the layers rich in cultural materials.

To understand the function of the structures, explored over a very small area, are to be queried the data obtainable from the archaeological deposits to which they are associated.

A multidisciplinary study has been undertaken, integrating studies over the cultural finds, the paleoenvironmental indicators, the faunal remains and dendrochronology. From the point of view of the deposit formation, thin sections for micromorphological studies were produced from undisturbed and oriented blocks. The aim was to reconstruct the accumulation of waste in heaps. A specific focus was on the remains of the firing structures and their byproducts (i.e., different ash forms).

The results can be compared and evaluated on a long-term diachronic perspective, as the context supports.

7 HOUSE FLOORS AND SETTLEMENT CHRONOLOGIES: EVIDENCE FROM WETLANDS AND BEYOND FOR IRON AGE ROUNDHOUSES IN SCOTLAND

Author(s): Cavers, Graeme (AOC Archaeology Group)

Presentation Format: Oral

This paper considers the results of two excavations of well preserved Iron Age roundhouse settlements in Scotland, UK carried out in recent years. At the Black Loch of Myrton, a series of well-preserved wooden roundhouses have provided sequences of superimposed floors and hearths that have yielded a diverse range of information sources on how the buildings were used and refurbished. A remarkably similar scenario has recently been encountered in a dryland context within the collapsed broch tower at Clachtoll on the north west mainland, recently the subject of conservation-led excavations. At this site, at least three phases of hearth construction accompanied frequent refurbishment of the house floor, with some evidence present for the differentiation of activity areas within the building. Specialist analysis of microstratigraphy, evidence from palaeoecological and chemical

proxies from as well as dendrochronology from these well preserved floor layers and their associated structures have led to a far more nuanced understanding of the nature and duration of roundhouse occupation in the later first millennium BC. This paper will compare and contrast the evidence from the wetland settlement at Black Loch with the dryland situation at Clach toll, discuss how far such comparisons can be extrapolated to explain patterns in the wider settlement record of the Scottish Iron Age and consider the implications for our understanding of the function of roundhouses more generally.

8 PROPOSAL FOR A SHARED DATABASE FOR HORIZONTAL WOODEN ELEMENTS FROM PILE-DWELLING VILLAGES

Author(s): Martinelli, Nicoletta (Laboratorio Dendrodata)

Presentation Format: Oral

The most striking and well-known image of a pile-dwelling site is the so-called “field of posts”, originated by the preservation of the lower part of thousands vertical posts stuck into the ground for dozens of years or even for centuries, in order to bear the roof or the raised floor of the houses, or the pathways, or to create palisades or other kinds of structure.

On the contrary, the number of woods coming from the upper parts of the buildings is very low. The recovery of these elements rarely occurs in the form of “horizontal woods” felled down in case of destruction or fire. Despite their great importance for the identification of building techniques and the reconstruction of the houses, these finds are scarcely published in an adequate way: very often their presence is only quoted in the text, more frequently some photos are presented, but very seldom their drawings and their measures are published, like they would deserve. That way when new discoveries happen, the archaeologist have to become as imaginative as possible to identify their possible use, in the absence of adequate items for comparison.

For overcoming the obstacle a common shared data-base to be filled by every archaeologist involved in pile-dwelling research would be needed. In the presentation all the characters and documents related to horizontal woods necessary for the purpose will be illustrated. A proposal for a twin database dedicated to the known elements of traditional architecture in wood will be illustrated as well and further suggestions from the audience will be well-accepted.

9 THE SETTLEMENT OF LAGHETTO DELLA COSTA (ITALY): THE PILE-DWELLING STRUCTURES, THE ABSOLUTE DATING

Author(s): Martinelli, Nicoletta (Laboratorio Dendrodata) - Gonzato, Federica (Polo Museale del Veneto)

Presentation Format: Oral

The site of the Laghetto della Costa is a perispondal pile-dwelling settlement, located on the south-western sector of the homonymous thermal lake, in the municipality of Arquà Petrarca (PD).

The site consists of an archaeological area distributed over a large surface along the southern and western shore of the lake basin.

Over the years, numerous excavations and discoveries identified several settlement zones along the perimeter of the lake, especially in the south-eastern shores: between 1885 and 1886 the first excavation were carried out by Federico Cordenons on behalf of the Civic Museums of Padua and National Museum of Este; in 1901 the excavations took place with Andrea Moschetti and Cordenons; in 1906 other excavations were carried out by Alfonso Alfonsi and Gherardo Ghirardini in the area southwest of the lake; finally, in 1909, an excavation campaign was conducted by Cordenons for the University of Padua.

The materials recovered, mainly ceramics, bone and antler artifacts and stone industry, testify the long duration of the settlements.

From the re-elaboration of data from the old excavations it was found that part of the settlement was made up of buildings on raised floor, while another part was set up on land reclamation structures built directly on the ground. The latter are described as “decks” of large oak beams, placed side by side and fixed by small vertical poles, constipated with branches of various sizes and large stones. The radiocarbon dating carried out on one of the small pole kept at the Museum of Padua allowed to date the construction between 2133 and 1983 cal BC.

New surveys and coring campaigns carried out in 2015 confirm the location of the old excavations, positioned with georeferencing.

The contribution aims to provide an updated reading of the known and unpublished data on the structures of the settlement.

10 LIVING IN A COMFORTABLE HOUSE: THE DWELLINGS OF OPPEANO

Author(s): Mangani, Claudia (Museo Civico) - Miller, Christopher (Universität Tübingen) - Nicosia, Cristiano - Polisca, Federico (Università degli Studi di Padova) - Gonzato, Federica (Polo Museale del Veneto)

Presentation Format: Oral

The modern town of Oppeano is located about 20 km south of Verona (NE Italy), in a territory rich in archaeological evidences dating from the Bronze to the Iron Age. Not far from the previously investigated settlement of Feniletto (dated to Late Bronze Age, 13th-12th c. BC) a newly discovered site, built with wooden elements, has been found in a portion of floodplain known as “Bussé”. This new site, named Vallese di Oppeano 4D, was discovered in 2014 during preventive archaeology operations for the construction of a pipeline crossing a vast area in northern Italy. The settlement, dated to the Middle Bronze Age, was excavated over an area of 350 square meters, with a trench of 5x70 meters.

Four phases have been identified, each one separated sometimes by gyttja the thickness of which suggests the alternating sequence of short-lived palustrine and alluvial environments. In Phase 2 the best preserved wooden structures from the original buildings were found. A sequence of room remains, marked by wood partitions and cooking installations (rebuilt several times) and associated rake-out deposits were observed.

This paper aims to illustrate the results focused on Buildings F and G of Phase 2a, where micromorphology and dendrochronology were carried out. In particular, cooking installations have been sampled to determine their function, the technology of construction and the nature of the waste they produced. Their accumulation as rake-out and variously trampled deposits resulted in the accretion of thick "domestic" sequences within the huts. These are intercalated to frequent reflooring episodes and are perfectly preserved due to waterlogging. These sequences offer therefore a unique opportunity for the reconstruction of activity areas and firing technology in these MBA buildings.

A. **LIKE, COPY AND SHARE: THE SOCIAL NETWORKS OF 6,200 BC ALPINE MEDITERRANEAN**

Author(s): Jerbic, Katarina (Flinders University, Adelaide)

Presentation Format: Poster

This poster shows some of the results from an interdisciplinary PhD research which focused of the climatic and socio-economic changes that occurred on the submerged prehistoric site in Zambrotija Bay, Croatia. Zambrotija Bay is located on the Istria Peninsula, approaching the very end of the Adriatic and the Gulf of Trieste. Preliminary underwater archaeological investigations revealed a unique case of a prehistoric pile-dwelling, originally placed near a freshwater environment, today submerged three metres under the Adriatic Sea. According to the archaeological evidence and one initial radiocarbon date, human activity in the settlement occurred sometime between the Late Neolithic and Early Bronze Age. The settlement was built on the outer edges of a karstic sinkhole, and the preserved wooden piles indicated an architectural resemblance to the contemporary prehistoric building tradition around the Alpine glacier lakes. The material culture, however, suggested that the settlement was a part of the Eastern Adriatic prehistoric cultural complexes. In 2017, as part of a PhD research, a series of interdisciplinary fieldwork activities were undertaken at the site, which resulted in seven seabed sediment cores and 20 waterlogged wood samples, taken with the aim to test the submerged Late Neolithic/Early Bronze Age pile-dwelling hypothesis. However, this study was also considering broader topics related to chronology, cultural migrations and occupational patterns in regional archaeology with an effort to enhance and connect the known prehistoric archaeological and environmental records. The multiple cultural and environmental actors and relationships between Zambrotija and the contemporary settlers of the Alpine pile-dwellings on the north, and makers of the Eastern Adriatic Nakovana-style pottery on the south, made the site a suitable candidate for recreating a social network analysis. The analysis was based on the accessibility of well-defined categorical limitations such as time, space and material culture, as well as cultural relations.

291 **CONTEXTUALIZING ARCHAEOLOGICAL ENGAGEMENT IN THE FIELD, LAB, MUSEUM, AND MEDIA**

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Balco, William (University of North Georgia) - Bedin, Edoardo (Arheološki muzej u Zagrebu)

Format: Regular session

The future of archaeology has become increasingly complicated as public perceptions of the discipline impact funding opportunities, research scopes, and heritage management policies. These impacts affect our research in a variety of contexts ranging from the field to governmental and regulating agencies. All archaeologists should consider the future of our sites, collections, data, and the broader discipline because today's research and public engagement shape the future potential of archaeological investigations. Likewise, all archaeologists must consider the role of engagement alongside the eventual dissemination of knowledge, not just data, to a general, public audience, via diverse media. Consequently, our interaction with the public must adapt to changes in the social context of archaeology, demonstrating to the public what archaeology is, why archaeology matters, and in doing so, defining legitimate, scientific archaeology from sensationalized pseudoscience. This session explores strategies that contextualize archaeological engagement by addressing these issues and drawing on case studies demonstrating critical and creative approaches to high-quality research, instruction, and engagement. Contributions will address methodologies employed in various disciplinary contexts, utilizing case studies to demonstrate solutions that engage and inform the public while maintaining rigorous professional standards.

ABSTRACTS

1 **EDUCATION THROUGH ENGAGEMENT: COMMUNITY ARCHAEOLOGY AT THE RICE FARM SITE**

Author(s): Balco, William (University of North Georgia)

Presentation Format: Oral

Recent archaeological investigation at the Rice Farm site in Dawson County, Georgia, have identified and examined a Native American settlement dating from the Middle Woodland period (approximately 300 BCE – 600 CE). Exploration of the site has incorporated university students alongside members of the local community, engaging the public in the process of archaeological investigation through geophysical survey, pedestrian survey, test excavations, and initial interpretation. This paper presents

public engagement strategies employed at the site, focusing on approaches that educate and inform while maintaining rigorous standards and contributing positively to understanding the archaeological record. Strategies that directly incorporate the participation of the public and shape their perception of archaeological investigation will be discussed, demonstrating the value of education through engagement in shaping public knowledge about the importance of heritage management, the scientific study of the past, and the preservation of archaeological sites. Finally, the benefits and challenges associated with educational engagement will be presented, creating a framework for meaningful community engagement in the 21st century.

2 MAKING ARCHAEOLOGY MATTER – TELLING SCOTLAND'S STORY

Author(s): Jones, Rebecca - Owen, Kirsty (HES Historic Environment Scotland)

Presentation Format: Oral

Scotland has a strategy for archaeology, launched at the EAA in 2015, which aims to improve the way in which archaeology is practiced and make it matter. Why should it matter? What is the purpose of public engagement? Where is the public benefit? We recognise that we have a responsibility to use archaeological activities for wider public benefit, and this means getting better at communicating the results of research. We can use archaeology to tell stories of the past, not just for their own sake but also consider their contemporary relevance, contributing to climate change, the promotion of diversity, the construction of sustainable communities and the appreciation and understanding of place.

As a national lead body, Historic Environment Scotland is seeking to bridge the gap between people's day-to-day lives and archaeology, making it clearer why it is important to everyone. We undertake archaeological fieldwork and research and also fund others. Through better, more relevant, stories and imagery, we can convey the information that we are all gathering in such a way as to increase public interest and benefit and, ultimately, make archaeology matter.

3 INDEPENDENT MUSEUMS, MULTIDISCIPLINARY MUSEUMS AND ARCHEOLOGY: THE EXPERIENCE OF THE ROYAL MUSEUMS OF TURIN

Author(s): Panero, Elisa - Pagella, Enrica (Musei Reali di Torino)

Presentation Format: Oral

Four years after the reform of the Ministry of Heritage and Cultural Activities, which marked the birth of state museums in Italy with special autonomy, the Royal Museums of Turin (MRT) propose an evaluation of the results in relation to one of the museum's souls: the archeology.

Since 2015, the MRT have brought together different museums: the Royal Palace, the Royal Armory, the Royal Library, the Sabauda Gallery, and the Museum of Antiquities. The first objective was to create a common identity and to bring together different collections, people and disciplinary fields. This has also meant to recreate the threads of the Savoy collections, enhancing the common substratum of origin of the collections and creating work and research platforms shared by archaeologists, architects and art historians. For the Museum of Antiquities, a museum that in the last decades has greatly strengthened its territorial vocation, linked above all to excavation archeology, has been to bring to light the value of the oldest museum nucleuses, linked to the collecting of the Savoy and local erudition, and centered on the great Mediterranean Civilizations.

The design and research choices have had to face a twofold objective: on the one hand to maintain firmly the vocation of archeology linked to the territory of belonging (and in some way to the Public Archeology) that the museum had built in the last thirty years. ; on the other, bring to light the other soul of the museum linked to collecting, the birth of European museums and antiquarian history.

The practical case therefore allows us to reflect on today's role of the great archaeological collections with particular regard to the relationship with the original places of origin and in the possible multidisciplinary dialogue with the different components that contribute to weaving the large canvas of collective memory.

4 PXRF AT THE MUSEUM: NON-DESTRUCTIVE ELEMENTAL COMPOSITION ANALYSIS OF COLLECTION OBJECTS

Author(s): Scott Cummings, Linda - Milligan, Jennifer - Varney, Robert (PaleResearch Institute) - Laurin, Gina (Denver Art Museum) - Reading, Paulette (MSA Conservation)

Presentation Format: Oral

Applications for X-Ray Fluorescence Spectrometry as an analytical tool in archaeologically- and anthropologically-related disciplines continue to expand. Museum staff are charged with the amazing, yet daunting, task of housing, preserving, researching, and showcasing our most valued cultural treasures, and this versatile tool can help. As a non-destructive technique for investigating elemental-based aspects of material culture, handheld XRFs are an effective analytical option for museum collections. Are artifacts in your museum or institution poisonous? Cultural and archaeological artifacts were routinely treated with pesticides to prevent infestations. This problem has been known for decades. However, many museum professionals still lack awareness about this potential hazard. Institutions have been slow to carry out testing of artifacts. Handling of contaminated collections puts museum staff, volunteers, and visitors at risk. Exposure to toxins as a matter of course for museum staff and outside curators can be minimized if an analysis is conducted on individual items and collections. Using a handheld XRF, it is possible to test for the presence of heavy metals such as arsenic, mercury, and lead associated with pesticides and elemental composition of pigments. In this presentation I use real life examples to demonstrate how to identify potentially contaminated artifacts, test

for pesticides, and provide guidelines on safe storage and handling.

5 **ARCHAEOLOGISTS AND HERITAGE MANAGERS: THE MISSING LINK WITH THE PUBLIC?**

Author(s): Bedin, Edoardo (Arheološki muzej u Zagrebu; National Trust for Scotland)

Presentation Format: Oral

In the eye of a modern visitor an archaeologist is seen as the scholar who investigates an ancient site and his/her primary objective is knowledge advancement to be shared amongst the academic community, however the visitor is not expecting from an archaeologist to actively engage with the general public and promote in an appealing fashion what he or she does for a living. However, quite a lot changed in the late 1990s when Time Team TV-show was aired in United Kingdom and Ulisse-il Piacere della Scoperta in Italy. These cultural TV-show offered a new insight to archaeology and more in general to heritage while archaeologists and heritage managers were "offered" the opportunity to open a dialogue with the general public. Since then archaeological field-schools and commercial excavations have become site attractions and heritage sites (museums and sites) had to develop a memorable "experience" as more and more people visited those expecting to receive up-to-date information on the on-going research. Public archaeology became embedded with archaeology and increasingly more often archaeological excavations offer tours of the sites, while heritage sites (museums and archaeological sites with no on-going excavations) have begun a massive up-date of their communication models. The emphasis is now on offering a scientific yet memorable experience.

This paper will concisely present in the first part the impact of cultural TV-show on the general audience and then introduce the case study of University of Reading field-school: Silchester Insula IX and Insula III and its public engagement strategy. The measure of success can be here highlighted by the site visitor figures: in 1997 just over one hundred visitors came to see the excavations versus an astonishing 4,500+ in only 36 days.

292 **PROCESS OF CHANGE FROM LATE ACHEULEAN TO EARLY MIDDLE STONE AGE / EARLY MIDDLE PALAEO-LITHIC IN AFRICA AND EURASIA**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Douze, Katja (Laboratory of Archaeology and Population in Africa, Anthropology Unit, Department of Genetics and Evolution, University of Geneva) - Meignen, Liliane (CEPAM, UMR 7264 – Cultures et Environnements Préhistoire, Antiquité, Moyen Âge, Université Nice Sophia Antipolis) - de la Torre, Ignacio (Institute of Archaeology, University College London)

Format: Regular session

This session aims to host presentations on one of the most crucial and intricate transitions in human history, from the late Acheulean to the early Middle Stone Age/ early Middle Palaeolithic. The combined approach on Africa and Eurasia offers the opportunity to overcome barriers caused by regional research traditions and compare views on hominin evolutionary trajectories and the nature of cultural change.

In Africa, the archaeological record indicates the coexistence of populations with different techno-behaviors; some are a continuation of Acheulean traditions until 200ka while others show an early development of MSA technologies before 300ka. The approach on transitional assemblages is difficult to standardize, and their interpretation is subject to a wide range of hypotheses, in which the biological transition from *Homo erectus* to the first representatives of *Homo sapiens* may also play a role. However, in Eurasia, different biological transformations are ongoing, and it is of particular interest to evaluate similarities and differences in the changes in material culture, in particular in view of the sub-contemporaneous development of prepared core technologies, flake, point or blade productions as main lithic strategies with regional variations in Africa and Eurasia by the end of the Acheulean. This raises questions on the links between culture and biology as sometimes perceived traditionally by Prehistorians, but also on the significance of the process of cultural change during this transitional period in terms of broad evolutionary dynamics.

The contribution of case studies from Acheulean and/or Middle Stone Age/Middle Palaeolithic from Africa and Eurasia, with a specific insight on the processes of changes, will certainly lead to improve our perspectives on this theme.

ABSTRACTS

1 **A LATE-ACHEULIAN TO EARLY-MIDDLE STONE AGE OPEN-AIR SEQUENCE AT AMANZI SPRINGS, EASTERN CAPE, SOUTH AFRICA**

Author(s): Blackwood, Alexander (La Trobe University) - Wilkins, Jayne (University of Cape Town) - Caruana, Matt (University of Witwatersrand) - Herries, Andy (La Trobe University)

Presentation Format: Oral

The Acheulean site of Amanzi Springs, first excavated by Ray Inskeep and Hilary Deacon in the 1960s, has featured prominently in syntheses of the Earlier Stone Age in the Eastern Cape Province of South Africa. The unique depositional context and ground-water chemistry at Amanzi Springs have resulted in the preservation of wood and other botanical remains in association with stratified artefact accumulations. Originally assigned to the late Acheulean based on artefact typology, the lack of an absolute chronology for Amanzi Springs has in the past limited its potential contribution to our understanding of spatial and temporal patterns of hominin occupation and technological organisation in this region during the Middle Pleistocene. Here we report on recent excavations at a newly discovered spring site at Amanzi Springs, referred to as Area 7, that contains a stratified sequence

of Earlier to Middle Stone Age artefacts, associated with preserved wood and macrofossil remains. Changing patterns of raw material procurement and use, the introduction of prepared core technology and a shift in reduction strategies away from large cutting tools towards the production of flakes, blades and points throughout the sequence at Area 7 provides an insight into the processes of change from the Earlier to Middle Stone Age in this region. Continuing work at this new locality at Amanzi Springs aims to develop a robust, high-resolution chronology, in order to examine technological change in an open-air context during a time period that is not well documented in South Africa.

2 HOW FAR WILL YOU GO? MIDDLE STONE AGE LITHIC PRODUCTION AND RAW MATERIAL ACQUISITION IN THE MAKGADIKGADI BASIN, BOTSWANA

Author(s): Staurset, Sigrid (School of Geography and the Environment, University of Oxford) - Coulson, Sheila (Institute of Archaeology, Conservation and History, University of Oslo) - Nash, David (School of Environment and Technology, University of Brighton; School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand) - Thomas, David - Burrough, Sallie (School of Geography and the Environment, University of Oxford)

Presentation Format: Oral

Access to resources and social networks spanning wide geographic areas is one behavioural feature commonly considered characteristic of modern humans. Provenancing of lithic raw materials makes it possible to trace movements across the prehistoric landscape and can potentially be used to address larger questions such as the emergence of migration routes or trade. Previous work in the under-researched Kalahari region has shown that partially prepared blocks of silcrete, the most common lithic raw material, could be geochemically provenanced to source areas more than 250km away. This contribution will present new results from recent excavations of open-air locales in the nearby Makgadikgadi Basin, where movement of raw material blocks can be traced across multiple Middle Stone Age sites and silcrete outcrops. Refitting shows that lithic material was imported to and exported from these sites at distinct chaîne opératoire stages, and that cores would likely be worked at multiple sites. It will be argued that transport of lithic raw materials a) should be seen as an integrated part of tool production and b) varied with differences in landscapes and raw material availability. The resulting mobility patterns may be key to understanding Middle Stone Age adaptation to resource rich and resource poor geographic areas. The presentation originates in an ongoing interdisciplinary project focused on mobility and landscape use in a hydrologically dynamic region.

3 THE RAVIN BLANC IV SITE, FALEME RIVER VALLEY (EASTERN SEGENAL): A LATE PERSISTENCE OF THE ACHEULEAN?

Author(s): Douze, Katja (Laboratoire d'Archéologie et Peuplement de l'Afrique, University of Geneva) - Rasse, Michel (Archéorient, Maison de l'Orient et de la Méditerranée, Université Lumière, Lyon 2) - Lespez, Laurent (Laboratoire Géographie Physique - LGP, Université Paris Est Créteil) - Tribolo, Chantal (Laboratoire IRAMAT-CRP2A, CNRS, Université de Bordeaux) - Huysecom, Eric (Laboratoire d'Archéologie et Peuplement de l'Afrique, University of Geneva)

Presentation Format: Oral

Data on Palaeolithic occupations of Senegal and of West Africa in general are rare. In recent years, investigations on the Middle Stone Age (MSA) are multiplying and tend to document periods from OIS 5 onwards, while solid data on older periods remain scarce. Previous investigations on the Faleme River Valley by A. Camara and B. Duboscq in the 1980s have led to the identification of Early and Middle Pleistocene sedimentary formations containing some Early Stone Age (ESA) industries. Our new investigations in this region have led to the discovery in 2017 of a well preserved and stratified Acheulean site named the Ravin Blanc IV. The lithic industry is typical for a knapping site dedicated to the production of bifaces and shows a Levallois-type production of large flakes. Preliminary OSL dates place this industry within late OIS 7, a period during which the MSA is already largely developed in some other parts of Africa. Here, we will present different scenarios discussing the late persistence of the Acheulean in this region. This discussion takes into account data such as the absence of known early MSA sites in West Africa and the recent identification, by other teams, of a late persistence of MSA traditions in Senegal, as well as data regarding the few other occurrences of very recent Acheulean sites in different parts of Africa. The ESA to MSA transition, as elsewhere, seems to show contrasted cultural trajectories that may echo intricate occupational patterns in West Africa.

4 THE LATE ACHEULEAN OF THE MIESO VALLEY (CENTRAL-EAST ETHIOPIA)

Author(s): de la Torre, Ignacio (University College London) - Benito-Calvo, Alfonso (CENIEH) - Mora, Rafael (UAB)

Presentation Format: Oral

The Mieso valley contains Middle and Upper Pleistocene deposits that were reported for the first time in recent years (Benito-Calvo et al, 2014; de la Torre et al, 2014). The Middle Pleistocene sequence has yielded several Acheulean occurrences that show significant inter-assemblage variability, including areas of handaxe production where conjoining sets are abundant, and sites where handaxes appear fully formatted and possibly used on-site. $^{40}\text{Ar}/^{39}\text{Ar}$ dates of the Middle Pleistocene sequence indicate an age younger than 212 ka for unequivocally-Acheulean sites which, if confirmed, would indicate persistence of this technology in the Rift Valley in a time span where the Middle Stone Age prevailed in nearby archaeological regions. This presentation will discuss the structure of the archaeological record in the Mieso Acheulean and contextualise it within the chrono-stratigraphic sequence of the East African Middle Pleistocene.

Benito-Calvo, A, Barfod, D N, McHenry, L J Torre, I de la 2014. The geology and chronology of the Acheulean deposits in the Mieso

area (East-Central Ethiopia). *Journal of Human Evolution* 76: 23-38.

de la Torre, I, Mora, R, Arroyo, A Benito-Calvo, A 2014. Acheulean technological behaviour in the Middle Pleistocene landscape of Mieso (East-Central Ethiopia). *Journal of Human Evolution* 76: 1-25.

5 THE END OF THE LOWER PALAEOOLITHIC AND THE BEGINNING OF THE MIDDLE PALAEOOLITHIC: THE VIEW FROM ARABIA

Author(s): Groucutt, Huw (Max Planck Institute for Chemical Ecology)

Presentation Format: Oral

Most research on the Lower to Middle Palaeolithic transition has been conducted in a few small areas of Africa and Eurasia. A clear understanding of this transition – such as identifying areas of population continuity in contrast to areas with occupational hiatuses – requires spatially and temporally representative study sites. The 3.2 million square kilometres of Arabia have long been known to have an abundant archaeological record, but it is only recently that scientific analyses such as chronometric dating have begun to be applied. Here I present recent findings from Arabia, particularly from the An Nefud desert in the north. In northern Arabia, the youngest dated Acheulean assemblage dates to MIS 9, and includes very small bifaces and a prepared core element. The oldest Middle Palaeolithic, meanwhile currently dates to MIS 7. Recent fieldwork offers significant new insights into both of these aspects. I explore different scenarios for the transition between these cultural phases, as well as situating the evidence within wider patterns of human prehistory and adaptation in Arabia as a whole. I hypothesise that the Arabian record demonstrates repeated hominin dispersals into the area, followed by localised cultural developments and repeated local extinctions.

6 THE MIS 7-6 ACHEULEAN IN THE ARABIAN PENINSULA

Author(s): Scerri, Eleanor (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

The Arabian Peninsula is situated at the nexus of the Old World, between Africa and Eurasia. Although long thought to have been a barren and unoccupied area throughout deep time, abundant Acheulean assemblages have been reported throughout the region. These assemblages are highly varied and typically found associated with river valleys and palaeolakes. Assemblage variation ranges from simply-flaked handaxes thought to represent older Acheulean assemblages, to small, finely flaked examples sometimes associated with Levallois technology and considered to be more recent - perhaps even representing the transition to the Middle Palaeolithic. Until recently, however, none of these Acheulean sites had been reliably dated. In this paper, the first securely dated Acheulean site in Arabia, Saffaqah, is discussed, together with a newly studied Acheulean site named An Nasim. Saffaqah is located in central Saudi Arabia and is associated with a prominent rhyolite dyke. The simple technology at this site is belied by the very young dates obtained, which are likely to span into MIS 6 and overlap with the earliest Middle Palaeolithic in the region. The site of An Nasim is located in the northern Nefud Desert and consists of fine, and often small handaxes associated with a deep lake. New dates and technological studies from An Nasim are discussed together with those from Saffaqah to elucidate cultural process of change from the Acheulean to the Middle Palaeolithic in a key, but poorly understood region for the Acheulean.

7 THE END OF THE LOWER PALEOLITHIC IN THE LEVANT: THE LATE ACHEULIAN AND ACHEULO-YABRUDIEN TECHNOCOMPLEXES (MIS 12-8)

Author(s): Zaidner, Yossi (Hebrew University of Jerusalem) - Meignen, Liliane (CNRS)

Presentation Format: Oral

Given its geographical location on out-of-Africa dispersal route and its well-preserved archaeological records dated to 400,000-150,000 years ago, the Near East plays an important role in understanding the new technical behaviors that emerge at the Lower-Middle Paleolithic boundary. In the Levant, this period witnessed a succession of three technocomplexes: the Late Acheulian, the Acheulo-Yabrudian and the Early Middle Paleolithic. In this paper, we present the main characteristics of the late Lower Paleolithic (Late Acheulian and Acheulo-Yabrudian technocomplexes).

The Late Acheulian is known from a number of open-air and cave sites, found both in Mediterranean and arid zones of the Levant. The lithic industries are characterized by the production of handaxes and roughly-made flake tools from simple cores. Although some indication for possible use of the Levallois technology was mentioned, it was not confirmed in more recent studies of new Late Acheulian assemblages.

Always found in stratigraphic position above the Late Acheulian, the Acheulo-Yabrudian techno-complex was only identified in the Northern and Central Levant. Similarly to the late Acheulian, the Acheulo-Yabrudian is characterized by the use of bifacial technology and simple flake production. It also contains two new elements: a specific core reduction for thick flakes production, which were often transformed into Quina scrapers and the earliest systematic blade production in this region. These components occur in the majority of the assemblages of this technocomplex, but in different proportions, thus resulting in a remarkable technological diversity. Levallois technology is absent.

Opinions vary on whether the Acheulo-Yabrudian technology is routed within the 'old' and simple Acheulian flake production or heralds the advent of a new Middle Paleolithic world. We will present the main characteristics of the two technocomplexes and address the question of the origin of Acheulo-Yabrudian on basis of the data from recently studied Acheulo-Yabrudian assem-

blages.

8 LEVANTINE MIDDLE PALEOLITHIC DURING MIS 8 TO 6 : AN OVERVIEW

Author(s): Meignen, Liliane (CNRS) - Zaidner, Yossi (Institute of Archeology Hebrew University)

Presentation Format: Oral

Always found in stratigraphic position above the Acheulo-Yabrudian, the Early Middle Paleolithic (EMP) assemblages exhibit an entirely different set of lithic production systems as well as tool types. Besides the total disappearance of the bifaces from the tool-kit, the onset of the EMP is characterized by systematic use of the Levallois method, the proliferation of elongated blanks generally produced through Levallois and Laminar methods and dominance of retouched points in the tool-kits. The presence of a significant Levallois component including flakes, blades and Levallois points is documented from the beginning of the EMP sequence. The points (retouched and Levallois) are a new component in the tool kit not recorded in the late Lower Paleolithic.

A clear technological break is thus evidenced between the Acheulo-Yabrudian and the Early Middle Paleolithic. This break needs to be interpreted in terms of social or biological changes (i.e. demographic shifts, increase of population densities, changes in mobility patterns). The expansion and diversification of the Levallois system at the onset of Middle Paleolithic raises the question of its origin. The possible arrival of exogenous population and/or of new ideas as suggested by the recent discoveries of AMH remains in Misliya cave, associated with EMP circa 185 ka, will be discussed based on comparisons with East African assemblages earlier than 250ka. In addition, the chronological variability of the EMP, which lasted from circa 250 to 150 ka, and eventual disappearance of the main EMP lithic characteristics circa 150 ka will be addressed.

9 THE LOWER TO MIDDLE PALEOLITHIC TRANSITION: A PERSPECTIVE FROM THE ACHEULO-YABRUDIAN, LEVANT

Author(s): Shimelmitz, Ron (University of Haifa; David Yellin Academic College of Education)

Presentation Format: Oral

The transition between the Lower and Middle Paleolithic in the Levant has been the topic of ample debate throughout the last decades and has received different interpretations and views. While some argued for a line of continuity between the two periods, others argued for a clear break and the arrival of a new population. The Acheulo-Yabrudian complex of the late Lower Paleolithic, dated to ca. 400-250 ka, constitutes the timeframe between the Acheulean, Lower Paleolithic and the Mousterian, Middle Paleolithic and marks the key for a better understanding of this transition in the Levant. In order to provide a fresh perspective of the nature of the discussed transition I wish to explore two venues addressing the transformations in lithic technology. The first will explore the extent to which we can identify the persistence of social learning and knapping traditions between the two periods as reflected through the industries at the various sites, focusing both on the micro level of the particular technological choices and the macro scale. Within the second venue, I will examine whether we can identify patterns of change within the Acheulo-Yabrudian sites characterized by a long sequence of layers. The question stands whether we can identify trends of change whereby elements that are characteristic of the Middle Paleolithic increased throughout the duration of the Acheulo-Yabrudian complex. The analysis is structured on published as well as new data from a set of Acheulo-Yabrudian sites, including Yabrud I, Syria, Masoukh, Lebanon, as well as Tabun and Qesem, Israel. The results suggest the complex nature of transition, in which alongside the presence of technological innovations some lines of continuity can be detected.

10 ARE THERE TIME TRENDS IN TECHNOLOGICAL BEHAVIOR FROM THE EARLY TO MID-PLEISTOCENE AT THE NIHEWAN BASIN, NORTH CHINA?: RECENT INVESTIGATIONS

Author(s): Pei, Shuwen - Ma, Dongdong (Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences)

Presentation Format: Oral

In assessments of stone tool assemblages of Eastern Asia, paleoanthropologists have frequently held that there are long periods of technological stasis, with no significant innovations until the second part of the Late Pleistocene. This view has been sustained for the Nihewan Basin, which contains the densest concentration of early Pleistocene Paleolithic sites outside Africa. However, a lack of detailed knowledge about Mid-Pleistocene lithic assemblages in the region hinders the establishment of time trends in the area.

The Yuxian basin, which preserves archaeological remains in fluvio-lacustrine deposits, is located in the southeastern part of the Nihewan basin, and since 2015 we have conducted systematic investigations of the area. The newly discovered Jijiazhuang-Qianshangying site complex (JJZ-QSY) has been excavated over an extension of 200 m², and >2000 stone artifacts and abundant fossils have been recovered. Biostratigraphy, OSL, ESR, as well as ²⁶Al/¹⁰Be dating indicate that early hominin occupied the area most between the mid to late Middle Pleistocene.

Sedimentological and taphonomic proxies suggest that the JJZ-B archaeological deposits were buried rapidly in shallow lake margin deposits of fine sands and silts that were minimally disturbed and subjected only to relatively low energy sheet wash. Lithic raw materials were procured ca. 6 km away from the site complex, with volcanic lava dominating the rock types, and siliceous dolomite and chert appearing less commonly. Flaking techniques are dominated by direct hard hammer percussion, although many small flake butts display a lip that suggests soft hammer flaking was probably used as well. The JJZ-QSY lithic assemblage shows a relatively advanced technology compared to the Mode 1 industries of the Early Pleistocene assemblages

in the Nihewan basin. Overall, the study of the JJZ-QSY site complex bears great potential on the research of human adaptive behavior and technological trends in the Nihewan basin during the Middle Pleistocene.

11 DIVERSITY OF CHINESE LITHIC TECHNOLOGIES DURING THE MIDDLE TO LATE PLEISTOCENE TRANSITION

Author(s): Li, Hao (Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences)

Presentation Format: Oral

Regarding the Palaeolithic lithic technology of China, one opinion holds that Mode 1 technology characterizing by simple cores and flakes persists for most of the Pleistocene. Using new archaeological findings and research achievements, this presentation shows a brief summary of lithic technologies existing in China during the transitional period from Middle to Late Pleistocene. Results show that during this time period lithic technologies in China exhibit clear diversity and complexity. Various technological complexes occur. These include: an Acheulean techno-complex characterized by large cutting tools, such as handaxes, picks and cleavers; a small flake tool techno-complex that features discrete tool types, refined retouch on blanks, and an increase in discoidal core flaking; and a techno-complex characterized by scrapers with Quina-like retouch. Different techno-complexes likely indicate that human groups possessed different cultural traditions. This provides a new perspective to discuss human behavioural adaptation to various environments and inter-regional dispersals and contact among different population groups.

293 THE CONSERVATION ARCHAEOLOGY OF DRY STONE MONUMENTS

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Cavers, Graeme - Barber, John (AOC Archaeology Group) - Cousseau, Florian (l'Université de Genève)

Format: Regular session

The conservation of dry-stone monuments presents a unique challenge: often, structures such as brochs, chambered tombs and other megalithic monuments are complex in architectural and engineering terms, meaning that a thorough understanding of the principles of their construction is necessary before they can be stabilised. The patterns of their collapse and decay can be similarly complex, often leaving fragile remains of corbelled cells, stair chambers and lintelled passages that can be a hazard to both archaeological deposits and the visiting public.

Equally important is the need to design an approach to conservation that preserves the important characteristics of the monument in such a way that visitors can understand the original form of the structure. Past approaches to drystone monument conservation have too often sacrificed the visibility and authenticity of original features for the purposes of practical simplicity.

A related issue is the extent to which archaeological investigation and documentation should be considered an obligation of practitioners undertaking intrusive conservation works, and whether such works should always be designed hand-in-hand with research questions.

This session will aim to explore the relationship between conservation works and archaeological research and consider the variety of approaches to the challenges outlined above taken across Europe. Papers are invited that consider:

- Conservation approaches and archaeological research design
- Use of new technology in conservation archaeology
- Conservation and presentation of archaeological interpretation.

ABSTRACTS

1 CONSERVING ANCIENT SPACES: RECENT EXPERIENCES IN THE CONSERVATION AND STABILISATION OF PREHISTORIC DRY-STONE MONUMENTS IN SCOTLAND

Author(s): Cavers, Graeme - Barber, John (AOC Archaeology Group)

Presentation Format: Oral

The structural consolidation and conservation of complex drystone monuments, such as the Neolithic chambered tombs and Iron Age brochs of Scotland presents unique challenges but also unique opportunities. Such monuments tend to be fragile, typically surviving in only fragmentary form with the essential structural components compromised by various combinations of collapse, stone robbing, erosion and, in some cases, ill-advised conservation. The carefully considered preservation of unstable structures in Scotland is essential to the heritage management of an internationally-important resource, ensuring their survival for future generations, but also presents an opportunity for greater understanding of the design concepts, construction techniques and original motivations for the erection of such architecturally challenging buildings. This paper will present recent experiences in the conservation of Scottish brochs and chambered tombs, and consider how understanding the principles of their construction is essential to the sensitive and appropriate stabilisation of their remnants, and to the preservation of their archaeological legibility.

2 AUTHENTICITY IN RESTORING A MEGALITH IN NORTHWEST FRANCE: THE EXAMPLE OF THE CARN TUMULUS AT PLOUDALMEZEAU (FINISTÈRE)

Author(s): Cousseau, Florian (Université de Genève)

Presentation Format: Oral

The tumulus of Carn, situated on the northern coast of Brittany, was simultaneously excavated and restored by P.-R. Giot in the 1960's. At the end of the excavation, the specialised company which was responsible for the restoration of the Barnenez tumulus, did a massive campaign according to P.-R. Giot's interpretation.

Our updated data from Carn, through its conserved masonries and excavation archives, permitted us to recognize P.-R. Giot's approaches of visibility and authenticity for its restoration. This example reveals the context and way of thinking about megaliths valorisation during the second half of the 20th century. Such restorations allowed archaeologists to build only one restitution of the monument that could impact the modern interpretation and preservation of megaliths.

3D modelling has also been used for the study of the Carn tumulus. These new tools increase the possibilities for architecture presentation and restitution. Using these methods, we drew new images for the Carn tumulus, which took more into account the different hypotheses for its biography. This digitisation of megaliths will allow us to redefine the approach of their restoration, preservation and authenticity related to their public presentation.

3 CONSERVATION STRATEGIES FOR ARCHAEOLOGICALLY EXCAVATED STRUCTURES IN A CLIMATE CHANGE FUTURE

Author(s): Douglas, Gavin (HES Historic Environment Scotland)

Presentation Format: Oral

Archaeology and specifically archaeological structures are generally accepted to be non-renewable resources. The ability to conserve and manage these national assets with consideration to the predicted weather events of the 21st century is being brought further into focus. There are numerous conservation charters and guidance both nationally and internationally that have been adopted in the conservation of built structures, the conservation of archaeological finds and the process of archaeology itself. What is missing is guidance on how to conserve archaeologically excavated structures and sites during excavation and any resultant public presentation post excavation. This research aims to create a strategy on how to approach projects and guidance as to how this can be applied.

Experimental works and data collection will include the review of relevant excavation plans, focussing primarily on the primary region of the North of Scotland and will study any conservation plans and survey sites for evidence of application and its effectiveness. The views of archaeologist who have managed similar projects will be sought to canvas opinion on the current procedures as well as methods theoretically or practically applied which may impact on conservation. New options for materials, methods and technology available especially for conservation and reinterpretation of sites including visual remodelling and remote access. archaeological structures in the specifically chosen sites and assess their condition. Experimental structures simulating conservation treatments have been constructed and their deterioration and movement is being monitored to give results which will show which is and which is not suitable to promote longevity of presentation.

From the data collected should be both quantitative and qualitative in nature and be thorough study of archaeological record which will in turn create an effective tools for future practitioners promoting, preservation, presentation whilst still allowing manageable visitor access.

4 PRESERVATION OF THE ARCHAEOLOGICAL LANDSCAPE OF ROCK ART SITES WITH SPECIAL REFERENCE TOWARD THE NAGSH-E- RUSTAM ROCK RELIEF SITES

Author(s): Ahmadinezhad, Sahar (Politecnico di Milano)

Presentation Format: Oral

Rock reliefs are mostly built in natural untouched environments. There is a great connection between the art work and the land shape and vegetation around it. Naqsh-e Rostam rock-cut architectural heritage accompanied with bas-reliefs, located in Mardasht county (Fars province of Iran), is an example of such heritage context. There, the rock formation is not only a source for artistic inspiration but had also regarded as the shelter for very old human settlements according to the presence of relevant cultural materials, i.e. traces of a rock relief belonging to Elamite period (c. 2000 BC). The continuity of rock cutting tradition and the use of old transportation system has caused the long-term settlements of people in the vicinity of the sites, which shaped rural structures in the borders of the landscape as a matter of fact. Up to now the conservation activities in these sites focuses on the rock reliefs especially with regard to use of preservative materials. This type of interventions not only may cause damage to the authenticity of the site and its environment but also has led to the negligence of other important aspects of the site (tangible and intangible) attested by archeological surveys. A more comprehensive methodology for preservation is suggested in this paper to respect better the integrity of all cultural layers and their spatial and anthropologic relations. This new approach, toward the cultural landscape, offers opportunities to better integrate natural and cultural heritage conservation. Therefore, the complexity of the territory and all the relevant cultural entities, tangible or intangible, were specially regarded within the framework of conservation management system.

5 THE READABLE INTEGRITY IN THE SCOTTISH DRY-STONE BROCH CONSERVATION: DEALING COMPLEXITY THROUGH FEATURE READING

Author(s): Liu, Chang - Theodossopoulos, Dimitris (ESALA The University of Edinburgh)

Presentation Format: Oral

The sophisticated drystone Iron-Age brochs of Northern Scotland, called Complex Atlantic Roundhouses by archaeologists, show a relatively high technological culture. Their architectural conservation should strike a balance in presenting their key features (structure, materials, building types, architectural elements) in a concept of wholeness rather than design unity. There is however uncertainty due to the lack of agreement for a standard broch scheme and the need for more archaeological research.

However, possible hidden architectural links can be made between the elements, like staircases, entrances, and center in broch, through a statistic study of brochs' plans and sections. The Scottish brochs, when read architecturally can show how choices are made among the options for each element based on a model of a standard broch. In this work, brochs from different geographic conditions are compared to conjecture the original design intentions and skills of the broch builders and highlight the importance of these characteristics when conservation is framed into a standard model.

The readable integrity of these architectural features within a context of constant fabric modifications is then discussed. The ruins cannot offer an architectural experience of the original design if each broch leaves a different impression to visitors which may challenge often popular broch definitions. Public attraction and scientific excavations are both important for broch conservation, so a balance must be established between them. This paper wants to open the debate for the extent of architects' approach to broch conservation, going beyond archaeological or temporary preservation of fragile features.

295 BETWEEN KINGS, CHIEFTAINS AND SLAVES? NEW WAYS OF TRACING SOCIAL STRATIFICATION IN THE CENTRAL EUROPEAN EARLY BRONZE AGE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Brunner, Mirco (University of Bern, Institute of Archaeological Science, Prehistory Department; University of Bern, Oeschger Centre for Climate Change Research - OCCR - Research Group, Prehistory Archeology; Christian-Albrechts Universität zu Kiel, Graduate School «Human Development in Landscapes») - Massy, Ken (Ludwig-Maximilians-Universität München, Institut für Vor- und Frühgeschichtliche Archäologie) - Ernée, Michal (Czech Academy of Sciences, Institute of Archaeology) - Hafner, Albert (University of Bern, Institute of Archaeological Science, Prehistory Department; University of Bern, Oeschger Centre for Climate Change Research - OCCR - Research Group, Prehistory Archeology) - Armbruster, Barbara (Centre National de Recherche Scientifique)

Format: Regular session

Social stratification in prehistoric societies has long been a major research topic. Especially the beginning of the Bronze Age world with a rapidly increasing hierarchization was and still is the focus of many of archaeological studies. Much research has been done in finding traces and evidences for the existence of the first state-like organisations in Central Europe. Most obviously the so-called princely graves of the Únětice culture represent people that gathered and inherited a lot of power and wealth. But those narratives of chiefdoms and early state societies portray only one of the possibilities within the diverse Early Bronze Age landscape and its different social structures. The task is to identify hierarchical structures also in those regions or contemporary societies without clearly visible archaeological signs of chieftains or other highly stratified systems.

The session will concentrate on the Early Bronze Age (2200–1650 BC) roughly between the alpine lake dwellings, the southern alpine villages, the Únětice culture and the Tell building societies of the Carpathian Basin. One major focus is gaining knowledge about social stratification from a combined investigation of settlement structures (centralization, fortification, large-scale food storage etc.), burial practices and hoard find patterns to identify different types of hierarchies. New scientific methods (aDNA, isotope analyses, metal analyses etc.) can help to uncover so far hidden social patterns by adding more information about kinship, mobility and trade management and can thus explain the emergence, maintenance and extension of hierarchical structures.

ABSTRACTS

1 SINGEN REVISITED. GIRLS, FEMALE FOUNDER AND TRAVELLING MEN

Author(s): Koch, Julia Katharina (Christian-Albrechts-Universität Kiel)

Presentation Format: Oral

The cemetery of Singen (Lkr. Konstanz, Baden-Württemberg, Germany) is commonly interpreted because of its rich variety of metal objects as one important site in the Early Bronze Age landscape of Central Europe and as a landmark within the development of bronze metallurgy. The material includes local and regional types as well as objects from far away like a faience bead in a girl's grave or the so-called Atlantic daggers in the burials of elder men. Also the gender-differentiated burial rites demonstrate influences from different directions. Those results were reasons enough to re-analyse the material of Singen as a case study in the BMBF-research project "life course reconstruction of mobile individuals in sedentary societies in Bronze and Iron Age Central Europe" (Leipzig University, funded 2009-11; publication in preparation). The project included an integration analysis of the material first at the individual level with the question how much foreign, regional and local marks show each grave. In comparison to the known social-archaeological and physical anthropological data and especially to the archaeometric isotope results of the project

it was possible to define social groups with different (inter)cultural expressions. The discussion was focused to particular possibilities of those social groups to influence the cultural identity of the Singen community. The paper will pick up the question how close individual life courses can be reconstructed including archaeological and anthropological data.

2 THE MISSING QUEENS AND KINGS? – ADNA REVEALS SOCIAL STRATIFICATION DURING THE EARLY BRONZE AGE IN SOUTHERN GERMANY

Author(s): Massy, Ken (LMU Munich)

Presentation Format: Oral

Cultural phenomena of the Early Bronze Age (EBA) in southern Germany have long been considered as little stratified. Unlike the entities of the Únětice culture in central Germany, the Wessex culture in southern Britain or El Argar, the groups of the so-called Straubing culture is not known for its exuberant rich graves. The differences between poor and well-furnished burials of the danubian EBA, which the Straubing culture belongs to, is indeed obvious, but single very elaborate princely graves are still missing and will be missing in the future. Also urban centres with a high level of social stratification and specialisation are unknown.

However, the implementation of new technologies and methods of studying human remains has given the opportunity to examine EBA burial sites of southern Germany in a different and more detailed way. The case studies presented in the paper will concentrate on social and biological interactions reconstructed on the basis of the results of aDNA research, isotope analysis and archaeological evidence. Thereby kinship and human mobility play an indispensable role to connect people, wealth and burial practices. Inter alia, the paper will address the question about how wealth was generated and/or passed down to biological descendants and which members of the communities participated in this social system.

3 WHERE ARE THE PRINCESSES? AN ALTERNATIVE SOCIAL SYSTEM TO THE „PRINCELY GRAVES“ FORMED EBA SOCIETY OF CENTRAL GERMANY?

Author(s): Ernée, Michal (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Oral

Princes and kings should lead the highly stratified and highborn men led EBA society in Central Germany during the first centuries of the second Millennium BC. But the Central German Aunjetitz society was only one part of the whole large Early Bronze Age Aunjetitz-system in the contemporary Central Europe. In the southern Aunjetitz regions (Bohemia, Moravia, Lower-Austria, Slovakia) we miss comparable rich male tumulus-inhumations completely. But we have identified almost equal rich female inhumations on common skeleton cemeteries in these regions. Based on the analyse of the rich Early Bronze Age Aunjetitz cemetery in Mikulovice, Bohemia, I will discuss the different social system in this Early Bronze Age Aunjetitz nodal region compared to the highly stratified EBA society in Central Germany. We should try to discuss an interpret how and why could behave two (or more) different social (and political?) systems within the frame of only one clearly defined entity cold archaeological culture.

4 WEAPONS, GOLD AND MONUMENTS – THE EMERGENCE OF EARLY BRONZE AGE RULING ELITES IN CENTRAL GERMANY

Author(s): Meller, Harald (State Office for Heritage Management and Archaeology Saxony-Anhalt)

Presentation Format: Oral

The Early Bronze Age of Central Germany is based on the fundamentals of the late Neolithic cultures of the 3rd millennium BC. Initially, the central German group of the Únětice Culture still shows Neolithic characteristics and rare metal goods. A sudden appearance of large quantities of bronze in hoards, as well as distinctions between burial equipment, indicate a radical social change at the transition to the second millennium (BrzA2 or Period I of the Northern Bronze Age) and testify to the extraordinary wealth in the region between the river Saale and the Harz mountains.

The funeral rites now illustrate a highly stratified society with so-called "princely graves" at the top, monumental burial mounds with elaborate design and outstanding grave goods that show a specific pattern and refer to Neolithic traditions. Multiple bronze weapons, gold objects and forging implements stand in sharp contrast to the generally "simply" equipped flat graves. Due to the mediating position of the Mittelbe-Saale region the "princes" were part of a long distance exchange and communication networks. Thus the people of the Únětice Culture were able to develop control over the transport routes and the North-South flow of goods.

In 2014 the monumental barrow "Bornhöck" was discovered, even bigger than the princely graves of Leubingen and Helmsdorf. A further "princely grave" once more draws attention to the social structure of the Early Bronze Age in Central Germany.

The lack of larger settlements or fortifications, the absence of signs of conflict and the long lasting social stability suggest a legitimised monopoly of power or a complex regulatory mechanism. Assuming this the comparison of the bronzes from tombs and hoards reveals conspicuous numbers which are similar to those from antique and modern military organisations and leads to a new approach in Bronze Age studies in Central Europe.

5 BURIALS, LAKE DWELLINGS AND TRADE ROUTES. THE DEVELOPMENT OF SOCIAL STRUCTURES DURING EARLY BRONZE AGE AT THE CENTRAL ALPS

Author(s): Brunner, Mirco (University of Bern, Institute of Archaeological Science, Prehistory Department; Oeschger Centre for Climate Change Research - OCCR - Research Group, Prehistory Archeology; Christian-Albrechts Universität zu Kiel, Graduate School «Human Development in Landscapes») - Hafner, Albert (University of Bern, Institute of Archaeological Science, Prehistory Department; Oeschger Centre for Climate Change Research - OCCR - Research Group, Prehistory Archeology)

Presentation Format: Oral

This paper offers a detailed summary of the state of Early Bronze Age research in Switzerland between the Swiss Plateau and the alpine region and introduces important grave, hoard and settlement finds. During the Early Bronze Age a large number of rich Bronze Age burials appear in Western Switzerland often connected to the emergence of bronze metallurgy and the exploitation of local ore deposits. Those graves display burial costumes and include material culture, especially bronze artefacts, which shows close relations to trans-European way of expressing prestige and status. The development of bronze consumption during the three phases of the Bronze Age at the central Alpine Area will be discussed.

In the Pre-phase (BzA1), 2200 to 2000 BC, metal finds like oar-headed pins and daggers remain scarce. Only during the classic phase (BzA2) between 1900 to 1750 BC outstandingly wealthy graves can be recognized, like Thun-Renzenbühl. Considerably more graves occur; the first hoard finds are deposited at this time. Additionally, gender distinctions in the burial rite become more regular and is visible in the burial equipment. The spatial extension and increasing density of settlements in prealpine areas and alpine valleys indicate the importance of the access to trade routes and resources. This development is backed by dendro and 14C dates from lakeshore and hilltop settlements. Between 1750 and 1550 BC gender-specific grave assemblages show strong contacts to Central Europe. The phenomenon of exceptionally well-equipped male graves is striking. It is discussed whether these are »young leaders« or assemblages of prosperous families.

Although we see an increasing rise in inequality in the realm of burial costumes the development of Alpine settlement dynamics, subsistence and metallurgy is a complex process that must not be subsumed to social evolutionist models of the evolution of hierarchical society.

6 THE BRONZE HAND FROM PRÊLES – AN EXTRAORDINARY SYMBOL OF POWER, PRESTIGE AND WEALTH

Author(s): Schaer, Andrea (Archäologischer Dienst des Kantons Bern)

Presentation Format: Oral

In autumn 2017 detectorists found near the village of Prêles (Canton of Berne) an extraordinary object: a nearly life size bronze hand, decorated with a golden bracelet. Together with the hand they unearthed a dagger and a human rib. The organic glue that was used to fix the golden bracelet on the hand allowed a radiocarbon dating of the object in the 15th or 14th c. BC. An excavation at the site provided the evidence that the hand came from the tomb of an adult male that was placed at the site of an older cairn. Further findings proved the dating of the tomb in the middle bronze age.

The bronze hand is so far the oldest known anthropomorphic bronze sculpture in middle Europe, if not in the whole of Europe. It raises many questions about it's meaning, use and about its owner. Was the hand part of a statue of a god or an ancestor? Did it serve as scepters or as a symbolic prosthesis? Was it just an extravaganza? What seems to be clear is that the hand is a symbol of power and it's owner or heir a member of a (so far unknown) local elite.

The paper aims at presenting and discussing this extraordinary find in an international context.

7 COPPER SMELTING ON THE BUCHBERG NEAR WIESING AND ITS SIGNIFICANCE FOR THE EARLY BRONZE AGE IN NORTH TYROL

Author(s): Keil, Jessica (Institute of Archaeologies Innsbruck)

Presentation Format: Oral

The Buchberg near Wiesing, an isolated hill within the North Tyrolean Lower Inn Valley, was occupied extensively during the Early Bronze Age and, on a smaller scale, during the Iron Age as shown by several excavations since the 1980s. The existence of three section ramparts, the lack of distinct buildings and the proof of metallurgical activities raises the question whether the features dating to the Bronze Age are to be interpreted as a fortification, a settlement, and/or an industrial area. Based on the current state of research it can be assumed that the copper smelting workshop was indeed the key feature.

The presentation will focus on the Buchberg as one of the earliest places of copper smelting in North Tyrol. It is of particular interest to examine the raw materials by scientific analyses in order to identify the exploited mining sites. Subsequently, the origins and distribution of both the raw materials and the produced copper as well as other finds associated with the metallurgical processes like, for example, slag-tempered ceramics might indicate how the Buchberg relates to other Early Bronze Age sites in North Tyrol. Thus it might be possible to understand the significance of the site on the Buchberg and the people there.

8 ARE BURIAL CUSTOMS OF THE EARLY BRONZE AGE MIERZANOWICE CULTURE IN SOUTH-EASTERN POLAND AN INDICATOR OF THE SOCIAL STRATIFICATION?

Author(s): Jarosz, Pawel (Institute of Archaeology, Adam Mickiewicz University, Poznań) - Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow; Department of Anatomy, Jagiellonian University Medical College, Cracow) - Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Centre for Mountains and Uplands Archaeology, Cracow)

Presentation Format: Oral

The dawn of Bronze Age is a time of advanced cultural changes including emergence of group of elites and developing the social stratifications. The south-eastern Poland is at the edge of this modifications that are clearly visible in other regions of the central Europe. Despite of this locations signs of substantial cultural changes could be detected mainly in funeral customs. An exceptional example of the development of cultural processes is a ceremonial burial place at Stryjów in the Lublin Upland where two barrows were explored. They are dated to the younger stage of the Early Bronze Age. In the central part under the barrow 1, four graves were found. East of barrow 1, the remains of barrow 2 were discovered. A telling feature of burials dug under barrows in Stryjów is the nature of their burial goods, different in several respects from the well-known inventories of Final Neolithic and those from the older phase of the Early Bronze Age. They lack the basic elements found in graves from previously dated cemeteries, including ceramic vessels. Another characteristic is the significant reduction in the amount of tools – in comparison with inventories in the 3rd millennium BC. From the four graves we only have one flint tool (perforator). Also, elements of weapons are less numerous and limited only to flint arrowheads. Rich and varied is, however, the assortment of ornaments, which include pins, elements of necklaces and earrings. A spectacular find from Stryjów is a small golden plate with a hole used for attaching a copper wire. This special burial place demonstrates that the trend of changes in social organization included areas of south-eastern Poland far away from the Early Bronze Age cultural centers.

The project is currently realized (NCN 2015/19/B/HS3/02149 and 2016/20/S/HS3/00307). Earlier investigations were financed by NCN 2012/05/B/HS3/04138.

9 NEW PERSPECTIVES ON THE SOCIAL ORGANIZATION OF SOUTHWEST SLOVAKIA IN THE EARLY BRONZE AGE

Author(s): Baca, Martin (Department of Archaeology, Faculty of Arts, Comenius University in Bratislava) - Bátor, Jozef (Department of Archaeology, Faculty of Arts, Comenius University in Bratislava; Institute of Archaeology SAS in Nitra)

Presentation Format: Oral

First of all, the concept of “state” has to be understood in the context of world which already had states. We don’t need to discuss that societies in Central European Early Bronze Age (CEEBA) were not on the same level and were “invisible” to the rulers of the Eastern Mediterranean. However, it could be fruitful to discuss how much developed and governed these societies of our concern were. In this paper we would like to discuss three different regions with rather different settlement patterns which consists of data with different information value from southwest Slovakia. The first region is upper Záhorie on the eastern bank of Morava river. The components are rather diverse (hoards, graveyards, settlements of various types) but are scarce. However there is one really huge settlement in Unín which likely “ruled them all”. The second region is Nitra river valley. Densely populated, all components are present, including graveyards with hundreds of graves. The third region is Ipel river valley, densely populated with Hatvan culture sites, which are actually mostly small fortified settlements. We shall explore if we could build three different models of social organization from these data (while keeping in mind that each of these models evolved on their own in time). What always concerned us however is that CEEBA is rarely compared to later periods of Middle and Late Bronze Age. We shall do that as well. It is fashionable nowadays to construct great narratives again. But to get the bigger picture, we again need to look at the processes that were involved, and that from longer and larger perspective.

10 DURING LIFE AND/OR DURING DEATH? CHALCOLITHIC AND EARLY BRONZE AGE ELITES NORTHWEST OF THE ÚNĚTICE

Author(s): Kleijne, Jos (SFB 1266 Scales of Transformation)

Presentation Format: Oral

Several ‘rich’ graves have been found in the Low Countries, the Orkney Islands and in Schleswig-Holstein dating to the Chalcolithic and Early Bronze Age (2500-1750 BC). These graves, because of their impressive grave goods, have often been interpreted as belonging to elites. But they can also be seen from the perspective of varying degrees of access to the (‘Bell Beaker’ or ‘Únětice’) networks of knowledge and information exchange and skill of ‘how things should be done’. The possibilities of acquiring special objects within these networks and the changing rhythms and patterns in burial practices can be related to the amount of skill in pottery production, to changing settlement practices and subsistence strategies. Also this provides a better account for the distribution of copper, gold and stone artefacts. Can we then still speak of the buried individuals as elites during life or should we consider these deceased from a different perspective?

- 11 WEALTH CONSUMPTION AND WHAT IT MIGHT TELL ABOUT SOCIAL ORGANIZATION. A CASE STUDY FROM THE MIDDLE BRONZE AGE CARPATHIAN BASIN**
Author(s): Laabs, Julian (Institute of Archaeological Sciences, University of Bern; Oeschger Center for Climate Change Research, University of Bern)
Presentation Format: Oral
- Applying the rather traditional method of constructing a wealth index based on grave goods and grave construction attributed to an individual, the presented study tries to open a dialogue for a more open-minded discussion towards Bronze Age social organization. The presentation will focus on the Bronze Age ceramic style complexes of the Carpathian Basin during the first half of the 2nd Millennium and their consumption of material wealth in burial rites.
- There is no rejection in the tendencies of increasing social stratification during the Bronze Age in Central European societies which becomes visible especially in the treatment of the dead. However, it seems possible to trace finer nuances of social organization when one is widening not only the methodological but also theoretical framework concerning the possible forms of social relations on intra- and intergroup levels. The vast spatio-chronological transformations in material culture during specific periods of the Bronze Age not necessarily pictures conquest or economic exploitation of neighbors but might results through the contact and exchange, not necessarily peaceful, between neighboring communities facing the same struggles.
- I hope to show that communities which were often conceptualized as different might share specific economic and social traits what makes the idea of cooperation between them more comprehensible. And instead of seeing two 'opposing' ceramic style complexes different from each other in the expression of material culture see a bigger group which share a common system of social and economic organization.
- 12 MONKODONJA - A HIERARCHICALLY-STRUCTURED SETTLEMENT OF THE EARLY AND MIDDLE BRONZE AGE AND ITS ROLE IN THE CENTRAL EUROPEAN COMMUNICATION-NETWORK**
Author(s): Hellmuth Kramberger, Anja (Universalmuseum Joanneum) - Teržan, Biba (University of Ljubljana Faculty of Arts) - Mihovilić, Kristina (Archaeological Museum of Istria)
Presentation Format: Oral
- In recent years, based on intensive research, it has become clear that the peninsula of Istria was integrated into the broad Central European communication network during the developed Early and Middle Bronze Age. On the one hand, this is evidenced by the finds of "Loaf-of-Bread Idols" and characteristic bronzes that came to light in the fortified settlement of Monkodonja, and on the other hand by the fact that the Istrian ceramic spectrum shows clear relations to the Danube-Carpathian region. Particularly noteworthy are elements from the ceramic repertoire of the Aunjetitz culture in Lower Austria with the Unterwölbling group and the Böheimkirchner group of the Věteřov culture. For some vessels it can also be assumed that they are imports from the aforementioned region.
- The research in the fortified hilltop settlement of Monkodonja has also shown that the settlement has pronounced hierarchical structures. These include differences in the architecture of individual areas of the settlement and differences in the spectrum of finds. Furthermore, there is evidence that centralized storage of large quantities of food, delivered from surrounding areas, has been practiced. On the one hand, we want to discuss in our presentation the findings and finds that support these hierarchical structures, and on the other hand, we will stress out the relationship with the Central European communication network.
- 13 EARLY BRONZE AGE GOLD WORK IN ATLANTIC EUROPE**
Author(s): Armbruster, Barbara (Centre National de Recherche Scientifique)
Presentation Format: Oral
- Gold work was an important means of cultural and social expression and exchange during the Early Bronze Age, a period rich in gold jewelry, decorative objects and also vessels. This paper deals with the development and change of the esthetic appearance and social function of luxury items, such as gold ornaments and containers, and with their particular fine metal working technology. Along Atlantic Europe, ideas and peoples moved exchanging information, goods and technological knowhow by maritime and terrestrial routes. The presentation aims in scrutinizing the development, change and interdependence of form, function and technology of ancient gold work. Local interregional and trans-regional Atlantic groups of gold items will be highlighted. One other topic will be the goldsmith's workshop, its tool kit and materials used, as well as questioning his social role in Early Bronze Age society. The presentation also intends to emphasize the particular symbolic meaning and decoration of ornaments. The interdisciplinary approach applied in this study includes archaeology, ethnoarchaeology, experimental archaeology, material sciences and information from ancient literary sources.
- 14 CREATING A RESEARCH FRAMEWORK AND STRATEGY FOR EARLY GOLD IN BRITAIN'S AURIFEROUS REGIONS**
Author(s): Sheridan, Alison (Dept. Scottish History & Archaeology)
Presentation Format: Oral
- This presentation outlines a current AHRC-funded initiative that has created an international network of those involved in the study of gold, to create a Research Framework and Strategy relating to gold use in Britain's auriferous regions, 2450-800 BC.

This deals with issues of locating and characterising the source areas; of identifying the compositional and physical changes that gold undergoes as it is worked, alloyed, mixed and recycled; of sourcing gold (including consideration of all the potential gold source areas); of understanding how it was worked, what the influences on goldworking traditions were, and how goldworking know-how was passed on; and of considering the value and significance of gold to its users in Britain's auriferous zones during the Chalcolithic and Bronze Age. Gold and goldworking were Beaker introductions to Britain, but from around 2200 BC, Cornish gold seems to have been used. We try to trace the pattern of raw material exploitation and of the changing provision and supply of gold over 1500+ years.

A. HIERARCHIES AND BALANCES: STRATIFIED AND NON-STRATIFIED SOCIETIES IN THE CENTRAL EUROPEAN BRONZE AGE

Author(s): Mueller, Johannes (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Poster

The constitution of social stratification is based on contradictions within societies that trigger the restriction of access to resources. While manifold features of different medial display of EBA surplus in burial mounds, artefact designs and house sizes, are usually interpreted as indication of social stratification, ethno-archaeological comparisons to EBA societies describe different possibilities of an interpretation. Beside stratified societies non-stratified societies existed contemporary to each other under similar economic, demographic and environmental conditions. In an attempt to identify different degrees of hierarchies and balances in Early and Middle Bronze Age Societies of Central Europe a hypothetical spatial division will be presented: between those areas, in which hierarchies are visible, and others, in which cooperative political constitutions were preferred.

The reproduction of social relations and especially the degree of social stratification seems to be based on the linkage of demography, economy and resource availability. The presentation integrates the results of our long lasting fieldwork in north eastern Central Europe and recent reconstruction of population values for BA groups.

296 DISCUSSING THE VALUE AND PUBLIC UTILITY OF ARCHAEOLOGY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Hanson, John (University of Reading) - Ortman, Scott (University of Colorado, Boulder)

Format: Regular session

Although archaeological research been spectacularly successful over the last fifty years, in many ways our perception of the value and public utility of the archaeological endeavour, as a social science, has been diminished. This is surprising, since it directly contrasts with something social scientists have known for some time – that the accumulation of socially learnt, culturally transmitted knowledge plays an important role in allowing human societies to adapt to changing circumstances. In this session, we would like to discuss the reasons for believing in the value and public utility of archaeology, taking time to reflect on the role of synthesis, the prospects of general models of human behaviour, especially with respect to the interactions between the environment, resource use, and agglomeration, and the kind of voice archaeological research should have in wider society. In doing so, we hope to make a case that archaeological research can and should make a crucial contribution to contemporary discourse.

ABSTRACTS

1 CAN A SYNTHESIS CENTER WORK FOR ARCHAEOLOGY

Author(s): Altschul, Jeff (SRI Foundation; Coalition for Archaeological Synthesis) - Kintigh, Keith (Arizona State University; Coalition for Archaeological Synthesis)

Presentation Format: Oral

Scientific funding agencies have invested heavily in synthesis centers in the biological sciences. At their core, these centers assume that collaborative synthetic research will advance scientific research more effectively and efficiently than traditional case study approaches. On measures such publications, impact values, and citations, synthesis centers have been phenomenally successful. While some synthesis center projects have been used as the scientific basis on which public policies have been based, the link between collaborative synthetic research and public benefit is not quite as clear.

Building on the model set by the National Center for Ecological Analysis and Synthesis (NCEAS), the Coalition for Archaeological Synthesis (CfAS) was established in 2017. CfAS' objective is to use collaborative, evidence-based synthetic research on deep-time social processes to advance science and benefit society. But how do we measure social benefit? And, as importantly, who decides if a given scientifically-informed public policy represents a public "good"? These are difficult questions, but we cannot shy away from them. In this paper, we discuss: how CfAS research questions emerge; how CfAS projects are designed; how we intend to use CfAS results to better society; and how you can become involved in CfAS projects.

2 DISCUSSING THE PUBLIC AVAILABILITY OF ARCHAEOLOGY

Author(s): Lodwick, Lisa (University of Oxford)

Presentation Format: Oral

In order for archaeology to be utilised by the broader public, research outputs have to first be accessible, that is not behind a pay-wall. This paper seeks to assess the current availability of archaeological research, data and analytical methods in the light of current debates surrounding open access, open science and the reproducibility crisis.

Access to digital journal articles can be seen as the first step towards research availability. Yet being located at the intersection of the humanities, social sciences and life sciences, movements towards open access in archaeology must negotiate a lack of funding for article processing charges and a reliance of learned societies on publishing incomes. Key examples of open access publication venues in archaeology are discussed and the broader open access landscape assessed.

Beyond research articles themselves, much reuse of archaeology requires access to primary data. This paper provides one of the few assessments of data sharing in archaeological research publications, reviewing the sharing of archaeobotanical data across specialist and general archaeology journals over the last decade. Archaeobotanical evidence provides a key data set for the assessment of human interactions with the environment, and being based upon biological categories, negates many of the difficulties of standardisation of material culture categories. However, only around 50% of research outputs provided their data.

To enable full reproducibility of archaeological research, the underlying analysis, ideally in the form of script, must also be provided. Whilst increasing, the availability of analytical methods in archaeological research is currently limited. Finally, this paper considers what archaeology can learn from other disciplines such as psychology which have made bigger steps towards reproducibility.

3 WHAT IS THE RELEVANCE OF ARCHAEOLOGICAL KNOWLEDGE PRODUCED IN DANISH CONTRACT ARCHAEOLOGY?

Author(s): Beck, Anna (Museum Southeast Denmark)

Presentation Format: Oral

The relevance of an excavation is often assessed on the basis of its contribution to archaeological knowledge, and an excavation that present new, sensational details about the past rarely needs further arguments. In Danish contract archaeology, the potential for new knowledge is even used by the Cultural Heritage Agency as an evaluation tool to decide whether an excavation should be conducted or not. However, there are no clear definitions of what 'new archaeological knowledge' is within the field. This ambiguity is, as I see it, not only problematic in the management of the contract archaeology but also for the research and communication of the results - and in the end, it spreads uncertainty about the contribution of archaeology in contemporary society not only among the public, but also among archaeologists themselves. A discussion of what archaeological knowledge is as seen from the engine room of contract archaeology is therefore needed.

In the paper, I will present some preliminary results from an investigation of archaeologists working in contract archaeology in Denmark and their perceptions of archaeological knowledge. The results will be used to identify and discuss some of the challenges in making archaeological knowledge relevant to present-day life. The paper is based on a current research project (2019-2020) that explore the present conditions for knowledge production in Danish contract archaeology as an essential first step in rethinking the connection between contract archaeology and contemporary society.

4 CAN ANCIENT CITIES TELL US SOMETHING MODERN CITIES CAN'T?

Author(s): Hanson, John (John Hanson)

Presentation Format: Oral

Although there have been considerable advances in our ability to investigate various aspects of human life through the collection of massive amounts of data, it can still be a significant challenge to measure socio-economic flows, even in the modern world, because of the wide range of channels through which these exchanges can occur. Having said this, it might be easier to investigate these issues by looking at what happened in the past, since we would not only expect goods and information to have been physically exchanged owing to lower levels of technological development, but also for these exchanges to have required physical infrastructure that we should be able to measure quite readily from material remains. In this talk, I will begin by exploring whether there are circumstances where archaeological and historical data give us the opportunity to develop theories in controlled settings or where these data might be just as good as, if not better than, modern data, before illustrating these issues with a case-study in the form of transport infrastructure and the magnitude of traffic flows in ancient cities. In doing so, I will argue that it is possible to detect a systematic relationship between the sizes of cities and this material, allowing us to contribute to a growing body of general theory about how settlements operate across space and time.

5 PROXIES WE CARE ABOUT: AN EXAMPLE FROM ROMAN BRITAIN

Author(s): Ortman, Scott (University of Colorado)

Presentation Format: Oral

One of the key steps in expanding the contemporary relevance of archaeology is developing proxies that connect the archaeological record to the types of data collected for contemporary societies. For example, in recent years house size has been used

by many authors as a proxy for household wealth. This has been a productive approach, but in many parts of the world houses are hard to identify archaeologically, even with excavation, and this leads to severe problems with regard to the study of wealth variation across time and space. In this paper, I suggest an additional useful proxy for studies of this kind is the accumulation rate of potsherds. I examine the remarkable database compiled for the Rural Settlement of Roman Britain Project in light of an emerging framework known as settlement scaling theory to show that the pottery accumulation rate and the coin loss rate both co-vary with settlement population in a manner consistent with a socio-economic rate. This suggests simple measures that are routinely available from the archaeological record, such as the kilograms of pottery per square meter of excavation per year of occupation, can be used to study economic processes in many societies.

6 SPATIAL ARCHAEOLOGICAL HYPOTHESES – A VISUALISATION METHOD AS CRUCIAL ARCHAEOLOGICAL CONTRIBUTION

Author(s): Lengyel, Dominik (BTU Cottbus-Senftenberg) - Toulouse, Catherine (Lengyel Toulouse Architects)

Presentation Format: Oral

Archaeology is the base for our self-awareness. This also concerns our built environment. Agglomeration from villages to metropolises and habitats from huts to palaces influence our relation to the environment and human behaviour in general. The culturally transmitted knowledge of co-living in agglomerations is one of the major achievements of mankind. Yet, spatial archaeological hypotheses are rarely communicated like architecture in contemporary discourses. Instead, archaeological sites are visualized as they might have appeared in their appropriate time. This way, the outcome of urban and building archaeology loses its relevance for today. One way of raising the value and public utility of archaeology concerning the built environment is to emphasize the intellectual achievements of lost architecture by abstracting as much of the time-referenced features in the visualisation and instead concentrating on the spatial relations of buildings and building parts. This way, traditional roots are made visible, the way knowledge in conceiving settlements has been transmitted to us through centuries is made visible. There is much more in common between archaeological metropolises and today's urban planning than assumed, even if both adapted changing circumstances. Classical composition rules survived as human societies continuously developed over centuries. By uncovering their relation to us, archaeological research does make a crucial contribution. This requires a method for visualizing architecture that literally translates archaeological hypotheses into visual representations working primarily with abstraction.

The presentation illustrates this method by several projects developed by the authors in their University Chair and in their architectural office in cooperation with archaeological research institutions like Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral), The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI) and The Palatine Palaces (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin).

301 THE ROLE OF ICAHM IN SUPPORTING ICOMOS AND UNESCO IN THE CONTEXT OF WORLD HERITAGE SITES

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Castillo, Alicia (Complutense University of Madrid; European Vicepresident of ICAHM. ICOMOS) - Musteata, Sergiu ("Ion Creanga" University of Chisinau; ICAHM)

Format: Regular session

This session aims at discussing the role of archaeologists in general and heritage managers in particular in the context of World Heritage (WH), as ICAHM is UNESCO's advisory body for this topic. Europe is the region with most WH sites in the world. Many of them are archaeological sites. On the one hand, this imbalance is a sign for the 'hegemonic Western vision of Archaeological (Cultural) Heritage' (UNESCO's Global Strategy 1994), on the other hand Europe serves as a great field experiment in heritage management. This session wants to discuss examples of best practice or other experiences highlighting archaeological heritage management issues at European World Heritage Sites. The main objectives are:

- To present ICAHM's Scientific Committee and the opportunities this international non-governmental organisation (INGO) offers to archaeologists.
- To discuss new challenges that archaeological heritage management faces (i.e. community involvement, evaluation systems, management plan strategies, conflicts of interpretation and decolonization models, conservation, environmental relationships, and contemporary archaeology).
- To establish a closer relationship between European archaeologists in order to grasp specific necessities of the area and discuss possible solutions that the ICAHM committee could implement.

We also welcome papers on WH sites from outside Europe to compare challenges and solutions across different world regions. In this context we would like to discuss how archaeologists from Europe can and should work outside Europe for example in processes of decolonization, together with African initiatives.

ABSTRACTS

1 WHAT IS THIS SITE ALL ABOUT? THE ROLE OF EXPERTS IN THE CONTEXT OF ARCHAEOLOGICAL WORLD HERITAGE SITES

Author(s): Dunning, Cynthia (ArcheoConcept)

Presentation Format: Oral

ICOMOS (International Committee of Monuments and Sites) and ICAHM (International Scientific Committee on Archaeological Heritage Management) play a major role in the nomination of experts for collaboration on archaeological UNESCO World Heritage sites. Yet many archaeologists do not know what international experts do in this context.

First I would like to define the role of experts before, during and after World Heritage nominations and give an overview of the structures in which they evolve.

Being an expert exposed to the management of World Heritage sites is not an easy task. It demands a knowledge of international archaeological heritage management and intercultural competences, but also empathy, curiosity and critical good sense.

Therefore I propose to analyse the strengths and weaknesses of the existing expertise system based on a large experience.

Resulting from this, I will propose a few leads to help improve the work of the experts and the existing structures.

2 CONSIDERATIONS ON THE MANAGEMENT OF ARCHAEOLOGICAL HERITAGE IN WORLD HERITAGE CITIES: CONVERGENCES OR DIVERGENCES?

Author(s): Pérez, Elena - Ferrer Román, Esther (Universidad Europea de Canarias) - Castillo Mena, Alicia (Universidad Complutense de Madrid)

Presentation Format: Oral

There is a strong debate on the management of the cultural heritage of World Heritage sites. This debate focuses in particular on exceptional universal values and how these values -not always universal in nature- are interpreted and integrated into the current societies that form to these cities and world heritage sites. At the recent World Heritage Best Practices Congress (Menorca, 2018), we presented a project named Parallel Cities developed in 9 world heritage cities. We identified that managing the multiple dimensions of a world heritage site shows divided reality. It enhanced by the tourist activity that has become a strong protagonist in these cities. For this reason and as a result of the reflections shared at that congress, we present this work in order to continue to deepen the management of these cities, in particular on the actions that institutions such as ICOMOS have generated with their declarations. The design of these cities has been carried out in an exhaustive way, with a strong incidence in the planning and commercialization that determine the generation of the concept of postmetrópoli. These expansive networks of multiple but homogeneous centers that have been generated end up annulling the urban complexity of previous centuries in order to homogenize the urban landscape of many of these cities. The result is a historic city distorted under the slogan of the traditional, which tries to contain the memory of the past in an indefinite state of museum character and places for leisure; it eradicates its main characteristic, the imagination and with it the desirable places of the city. We will analyse the city of San Cristóbal de La Laguna (Canary Islands, Spain) as the main example. We hope to be able to help design follow-up actions for these international organizations on the concept of cultural heritage management.

3 THE MANAGEMENT OF WORLD HERITAGE ARCHAEOLOGICAL SERIAL SITES: AN ONGOING EXPERIMENT

Author(s): Brancelj, Ana (Université Savoie Mont Blanc)

Presentation Format: Oral

In 2018, there were 343 World Heritage (WH) cultural sites in European Union (EU28). More than one third of them are serial WH sites, composed of more than two spatially separated components. A fair number of them are archaeological serial WH sites of intercommunal, interregional, national or international spatial configuration. For a favorable management of the whole, these heritage sites demand a complex coordination and cooperation of archaeologists and heritage managers.

The aim of this communication is to review the category of WH archaeological serial sites in general, and transboundary serial sites in particular. Moreover, we want to drag attention on the management challenges these UNESCO sites deal with. Through case studies we want to present how, within the same WH serial site, different archaeological paradigms result in various interpretations of archaeological heritage, but also in different conservation strategies and management models.

Specifically, in the context of underwater and wetland transboundary WH serial archaeological site, a comparative analysis will be presented. It will show the different conceptualization of the heritage that can be observed in the pre-inscription period (in the selection of the sites, the designation of the core and the buffer zones, the consideration of related and/or associated sites) and how they result in the post-inscription management policies (protection, conservation, valorization). Finally, the differences that can occur between archaeologists' and heritage managers' point of view will be discussed, as well as the importance of their mutual transfer of knowledge.

4 SENSE & SUSTAINABILITY CONFERENCE: INTERNATIONAL CONFERENCE ON ARCHAEOLOGY AND TOURISM

Author(s): Gowen Larsen, Margaret (ICOMOS ICAHM; EAA Community on Integrating the Management of Archaeological Heritage and Tourism) - Willems, Annemarie (ICOMOS ICAHM; EAA Community on Integrating the Management of Archaeological Heritage and Tourism; AW Heritage Consultancy)

Presentation Format: Oral

This paper will present the results of the Sense and Sustainability conference 6-10 May 2019 in Zagreb which will bring together experts and practitioners from tourism and archaeological heritage management from all over the world. The conference's focus is the sustainable management and use of archaeology in heritage tourism. The conference, in which EAA and the EAA Community on Integrating the Management of Archaeological Heritage and Tourism are organising partners, is being hosted by the Archaeological Museum in Zagreb. It is part of the Interreg Danube Transnational Programme 2014-2020 and is being partly financed by the Project. The conference seeks to analyse current theoretical and practical issues from across the cultural heritage tourism stakeholder spectrum by opening the door to a variety of practitioner experiences and perspectives.

The Conference is centered around four main themes:

- Heritage in tourism destination management
- Sustainable development, archaeology and tourism
- Tourism and archaeological heritage management in Protected areas, World heritage sites and National parks
- Cultural routes.

5 ACCESS TO THE WORLD HERITAGE SITES IN ROMANIA. A CASE OF DACIAN FORTRESSES

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

Presentation Format: Oral

Romania is among the 193 states that signed the World Heritage Convention since 1990 when has become part of one of the most important international treaties. Romania has inscribed eight sites: Danube Delta (1991, natural site), Moldavian Churches (1993), Horezu Monastery (1993), Villages with Fortified Churches in Transylvania, Fortresses from the Orăștie Mountains (1999), the Sighisoara Historic Center (1999), the Maramureș Wooden Churches (1999) and the Ancient and Primary Beech Forests of the Carpathians and other regions of Europe (2017). In 2018 Romania had a great opportunity to register a Roșia Montană Mining Landscape site, but the Government decided to suspend the registration process that was already in its final phase. However, the real implementation of the Convention began in 2000, when the first legal instrument was approved by the Government regarding the establishment of measures for the protection of historical monuments belonging to the World Heritage List. Between 2000 and 2011 other normative acts were adopted, but until now the normative situation requires better development. Unfortunately, until today just two World Heritage Sites have the management plans (Danube Delta and Horezu Monastery) and the state of conservation is an actual topic for all of them.

The World Heritage Sites are attractive from many points of views and the access to the sites is an important issue. My presentation will be focused on the Fortresses from the Orăștie Mountains, which includes six Ancient sites. Because they are placed on an original landscape, the access to some sites is very difficult. But, the access to the sites should be discussed from large perspective, which include general information of each site, the ways of access, stops, parking, and other facilities. So, in my presentation, I will discuss the relation between general information of the sites and access to each of them.

6 CASTLES AND MONASTERIES IN LOWER SAXONY - ARCHAEOLOGICAL RESEARCH, NATURE CONSERVATION AND HERITAGE MONITORING BY UAV

Author(s): Blaich, Markus C. (Lower Saxony State Office for Monument Preservation)

Presentation Format: Oral

Since 2016, the Lower Saxony State Office for Monument Preservation has been using various UAVs for the documentation of archaeological excavations or archaeological monuments. This is mainly done by aerial photography. Encouraged by the cooperation with the UNESCO-certified GeoPark Harz, the UNESCO World Heritage Foundation Harz and ICOMOS (German section), the State Office has begun to expand the criteria for monitoring especially medieval monuments. Since 2017, aspects developed in environmental and nature conservation have been integrated, for example the use of the process „Structure from Motion“. This was initially tested at archaeological sites, but will also be used for architectural monuments.

A further aspect is the future linking of the monitoring of monuments (buildings) and archaeological sites in one work step. In this paper, examples of the targeted combination of infrared images (IR), LIDAR-Scans and various archaeological prospection methods will be presented and the possibilities of monitoring for large listed areas will be discussed.

7 PERSEPOLIS REBORN?

Author(s): Dunning, Cynthia (ArchaeoConcept) - Karimpouri, Hossein (ICHTO) - Fadae, Hamid (ICHTO; Persepolis Site Manager)

Presentation Format: Oral

Persepolis was nominated UNESCO World Heritage in 1979. If the general public knows about the Achaemenid palaces and Necropolis, very little know about the modern history of the site. At the entrance of the archaeological area, the second king of

Pahlavi, last Shah of Iran, built a tent city to invite his royal guests for the celebration of 2500 years of Iranian monarchy in 1971. The vestiges of these tents still exist and are situated in the core zone of the nominated property.

After 45 years, the Iranian Cultural Heritage and Tourism Organisation (ICHTO) would like to renovate the structures and integrate them into the master plan for the touristic development of the site. Many ideas have been mentioned, yet is not quite sure what is allowed or not following UNESCO directives.

The following questions must find answers and we are persuaded that a discussion with archaeological heritage management specialists may lead us to find appropriate solutions :

Is a reconstruction possible ? And if so, how can these tents be used ? Should they be used for an exhibition of arts and crafts, a 3D dome cinema, as a place for public enhancement such as archaeological workshops for young people, or even as a luxury hotel, much like the original use of most the tents ? Could this area also be the place for a much needed research centre, archive and management office ?

This paper will address the opportunities, challenges and limits of developing a WH property nominated more than 40 years ago, when UNESCO had other expectations. We will particularly stress the development of the use of the core zone.

8 PROVENANCE AND AUTHENTICATION OF RECONSTRUCTIONS: THE FUTURE OF PREHISTORIC BUILDINGS IN THE JOMON SITES OF JAPAN WORLD HERITAGE NOMINATION

Author(s): Ertl, John (Keio University)

Presentation Format: Oral

Since 2009, eighteen Jomon period (14,000-300 BCE) sites in Northern Japan have been undergoing nomination as World Heritage. These sites represent the diversity of Jomon hunter-gatherer culture that exists throughout the Japanese archipelago. Of the many hurdles during nomination, one question that remains is what to do with the fifty-seven reconstructions (pit houses and post-in-ground buildings) at these sites. As Jomon buildings were made from organic materials, it was mostly indirect remains that informed their design. As such, some have called for these buildings to be dismantled because of their potential to distort the image of the past. Others argue they are essential resources for education, tourism, and revitalization.

This presentation examines the problems of provenance – the ability to trace back the data and decision-making processes that informed their shape. Prehistoric reconstruction has a short history in Japan, with the earliest examples from the late 1940s. Today there are approximately 350 sites with 900 buildings. Over that time, several aspects of their material and design remain obdurate, while others have radically changed. This paper argues that the debates of authenticity stem from the overall lack of recording their provenance. In some cases, revolutionary new analytical techniques are applied, while others simply copy earlier designs – but for the most part this information is not recorded. In looking to the far future of these World Heritage sites, archaeological remains will not provide new data to resolve all the questions that surround them. What will be important is documenting the decisions, experiments, trials, and the mistakes that will continue to inform and re-inform their shape. In this regard, archaeology in the future should strive to learn more from its own history than from remains belonging to the ancient past.

302 INSIGHTS INTO THE INSIDE. THE CONSTRUCTION OF RAMPARTS AND RELATED QUESTIONS ABOUT A KEY ELEMENT OF PREHISTORIC FORTIFICATIONS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Ibsen, Timo (Zentrum für Baltische und Skandinavische Archäologie) - Messal, Sebastian (Deutsches Archäologisches Institut) - Jarockis, Romas (Baltijos regiono istorijos ir archeologijos institutas, Klaipeda University)

Format: Regular session

Ramparts are the most common features of fortifications and often form a complex system in order to protect a defined inner space. Their construction is influenced by many factors: the geographical and topographical position, the chronology and duration of occupation, the function and purpose, as well as cultural relations and societal preconditions. The analysis and interpretation of archaeological results strongly depend on the methods and extent of the investigation. Next to traditional archaeological excavations and surveys, the spectrum of minimal-invasive methods for investigating ramparts have developed significantly in the past decades and can add a lot of new information, especially about the outline and extent and also their internal structure.

Under the assumption that ramparts and the often accompanying ditches contain key information about the construction, chronology, and function of the whole monument complex, the session aims to have ‚insights into the inside‘, so a closer look at and into these crucial elements of fortifications and summarize and reflect the knowledge about ramparts.

In addition, there are many unsolved questions dealing with related archaeological, technological, and societal aspects: Is it possible to find common intercultural links in building traditions of fortifications? Who had the technical knowledge of constructing and maintaining ramparts and ditches? Which strategical aspects led to which type of fortification? Why were they built at all, which societal preconditions made them necessary?

Papers should present best practice examples of investigating systems of ramparts and ditches from all geographical regions of Europe, demonstrate results related to their construction, focus on the methodological aspects of investigation, or address related questions about the organization of the building processes and the underlying societal infrastructure.

- 1 INTRODUCTION: INVESTIGATING WALLS AND RAMPARTS – PROBLEMS, NEEDS AND CHALLENGES**
Author(s): Ibsen, Timo (Center for Baltic and Scandinavian Archaeology) - Messal, Sebastian (German Archaeological Institute) - Jarockis, Romas (Vilnius Academy of Arts)
Presentation Format: Oral
- The big number of fortifications like hillforts, strongholds, promontory forts or enclosures of different types in Europe as well as the wide geographical, chronological and functional variety of the monuments led to different methodological approaches, strategies and results of investigations of fortifications in the past.
- Numerous excavations within several decades of archaeological research have provided various information about the occupation layers, functions and chronology of ramparts, walls and ditches as the main constructive elements of fortifications. Nevertheless, new information can be gained under the application of interdisciplinary methods. Such approaches provide new results regarding the construction and stratigraphy of the monuments. In the introduction the organizers will highlight some of the main questions about the investigation of fortifications and especially their defensive structures.
- Problems, needs and challenges of fortification research will be discussed on the basis of a few, well studied monuments to evaluate, which of the many investigation methods provide us with which particular information. The introduction develops a red line for the session and supplies the participants with a theoretical background for the later discussion.
- 2 OF ICE FORTS AND BOAT TRAPS - ARCHAEOLOGICAL AND ETHNOHISTORICAL EVIDENCE OF DEFENCE BUILDING AMONG SIBERIAN HUNTER-GATHERERS**
Author(s): Piezonka, Henny (Christian Albrechts University Kiel) - Chairkina, Natalya (Institute of History and Archaeology, Urals Branch, Russian Academy of Sciences) - Kardash, Oleg (Severnaya Arkheologiya, Nefteyugansk) - Kosinskaya, Lyubov' (Urals Federal University, Ekaterinburg)
Presentation Format: Oral
- Prehistoric fortifications are generally associated with agricultural societies, while hunter-gatherers forts remain an underexplored field in archaeological and anthropological debates. In this context, the seven millennia deep history of fortified settlements in the Western Siberian taiga represents an outstanding phenomenon in world prehistory. After an initial emergence of settlements fortified by ramparts, ditches and palisades in the 7th-6th millennium cal BC, further peaks with hundreds of defensive constructions occur in the Iron Age and in Early Modern times. Investigations of this phenomenon are still very limited, and in-depth analyses of defensive structures, their functions and diachronic developments are lacking. Research into this complex has the potential to open up a new facet in hunter-gatherer archaeology and also enhance the understanding of the rise and effects of intergroup conflict in acephalous, heterarchical societies. From an archaeological point of view, favourable preservation conditions of surface features such as ramparts, ditches, gates and pit houses in the unploughed taiga forests as well as organic preservation in the permafrost regions to the north lead to a particularly rich, accessible archaeological record on these fortified sites. Of special relevance is ethnohistorical evidence from Russian sources as well as folklore of indigenous groups, providing unique information on both the societal background of Siberian defensive structures and the connections between built structures and particular defensive strategies. The sources indicate that at least the historically documented defenses were often protecting hunter-fisher communities from raids of herding nomads, both from the steppe and the tundra, and they also yield rich information on defensive practices not generally thought of when interpreting archaeological structures, such as intentional ice-covering of ramparts. In our talk, we will present first results from joint Russian-German research in Western Siberia devoted to the diachronic study of defensive constructions based on archaeological and ethnoarchaeological fieldwork.
- 3 IRON AGE FORTIFICATIONS REVEALED. INNOVATIVE APPROACHES IN MULTIDISCIPLINARY RESEARCH OF HILLFORTS IN SOUTH-EASTERN ALPINE REGION**
Author(s): Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia) - Horn, Barbara - Mušič, Branko (University of Ljubljana; Gearh d.o.o.) - Vinazza, Manca (University of Ljubljana) - Medarić, Igor (University of Ljubljana; Gearh d.o.o.)
Presentation Format: Oral
- In the recent years, our research was focused mainly on fortified Early Iron Age hillforts and their surrounding landscapes between the south-eastern Alps and the Pannonian plain. The complexity of this sites yields for innovative approaches, integrating diverse methods and techniques, borrowing, adopting and adapting their methods. We have developed a research approach, which has a firm framework, where remote sensing (e.g. ALS) and a broad array of geophysical methods and low-invasive archaeological methods play important roles. Besides that, the approach is flexible enough, to fit the individual landscapes and to answer various research questions.
- One of the techniques, recently included in our tool-box, is the electrical resistivity tomography (ERT), which has many great applications in non-destructive revealing of geoarchaeological and archaeological features. Our surveys at several fortified sites resulted in data sets of non-expected quality. During investigations of different fortification structures, e.g. ramparts, walls and ditches, located in diverse geological settings, they were also compared with results of other traditional archaeogeophysical

methods and finally by targeted archaeological excavations.

The more important advantages of the ERT are its contributions to the determination of position, geometry and exact depth of buried archaeological structures and enables reliable predictions on type of constructions. As a surplus also data about the surrounding medium are obtained, which can be applied in combination with other proxy data for interpretation of wider geoarchaeological and palaeoenvironmental contexts of either individual archaeological site and/or areas between them.

4 **RAMPARTS OF ESTONIAN PREHISTORIC STRONGHOLDS: CONSTRUCTIONAL AND CHRONOLOGICAL ASPECTS**

Author(s): Valk, Heiki (University of Tartu)

Presentation Format: Oral

Prehistoric strongholds of Estonia (ca. 130 in number) represent two geologically different regions. In northern and eastern Estonia limestone bedrock is covered by rather modest layers of moraine, but in inland Estonia the Devonian sandstone has been buried under glacial deposits of clay, gravel and sand. The retreating glaciers left different landforms in the two regions of Estonia – sea-related districts are flat, but inland areas are often of hummocky character. These circumstances determine also the role of ramparts among the prehistoric fortifications in different parts of the country. In flat areas of western Estonia the defence system of strongholds is based not on the natural difference of heights, but on massive man-made circular ramparts. On “real” hill forts, i.e. on hilltop or promontory strongholds, the ramparts, if existing at all, are/were of smaller dimensions.

Geological preconditions have also determined the construction material of the ramparts of Estonian prehistoric strongholds. In limestone areas the ramparts were made of limestone, resembling those on the Swedish islands of Öland and Gotland. In inland areas ramparts were built of earth and sand, being supported both from the inside and the outer sides by timber structures.

The chronological dimension of the ramparts of Estonia begins with the Late Bronze Age, stretching to the early 13th century and sometimes to the first half of the 14th century. Excavations show that in several cases the ramparts were re-constructed and extended. In some cases also gateways have been opened.

5 **MORE ON THE DATING AND CHARACTER OF THE DEFENSIVE CONSTRUCTIONS OF OLD PRUSSIAN HILLFORTS**

Author(s): Khomiakova, Olga (Institute of Archaeology of RAS, Moscow) - Skhodnov, Ivan (NIC Pribaltijskaja Archaeologia, Kaliningrad)

Presentation Format: Oral

Hillforts of the Old Prussians (and preexisting Aestii) played a special role in the settlement pattern in The South-East Baltic. Data of natural science research and radiocarbon dating indicate that they could have been used for a long time, from the Bronze Age to the early Middle Ages. However, the issues related to the typology of hillforts in the central part of the former East Prussia are not resolved. Available information about their structure shows that the settlements differ greatly in elements associated with the structure of fortifications – ramparts and ditches. Data on the settlement pattern in Old Prussia's territory indicates, that by the beginning of the 2nd millennium it could be composed of many local centers with hillforts in a key role. But the construction of ramparts and ditches indicates, that only some of them could perform a serious defensive function. Such hillforts are usually located in strategically important regions; readily lend itself to control the territories and resources, associated with the period of the Teutonic Order expansion. The question is, could it have happened, that been distinguished with a fairly stable and conservative social structure, Old Prussians could create the solid defensive constructions for their hillforts only by the 12–13 century in the face of external conquest? Although there is still not much data, we will discuss the available information with the using a number of modern research methods on Old Prussian hillforts, located in the central part of the modern Kaliningrad region.

6 **“BORING RAMPARTS” – NEW INFORMATION ABOUT THE INNER STRUCTURE AND CHRONOLOGY OF BALTIC ENCLOSURES**

Author(s): Ibsen, Timo (Center for Baltic and Scandinavian Archaeology)

Presentation Format: Oral

Ramparts and ditches are the most obvious elements of prehistoric hillforts in the Baltic region and many other European landscapes. Due to their size and complexity excavations of these parts of fortification need a lot of time and hence have not been conducted on a lot of monuments, especially in the Kaliningrad Region of Russia with its approximately 140 hillforts. Only a few of them have been examined by larger excavations in 150 years of research history. The few published results show, that the monuments have mostly been constructed from wood, earth and sometimes stones, forming several distinguishable layers or rather phases of erection, destruction and reconstruction. But find material is sparse and often is limited to pottery fragments, which – due to their uniform appearance and shape - are difficult to date.

Precise dating supported by natural sciences such as Radio-Carbon-analysis are available only for a few monuments in Poland, Lithuania and Latvia, but they are absolutely absent for the Kaliningrad Region.

In the context of a bigger project on settlement archaeology, conducted by the Centre for Baltic and Scandinavian Archaeology in Schleswig and the Museum of Prehistory and Early History in Berlin and financed by the Academy of Sciences and Literature Mainz, the author developed a new strategy for the dating of hillforts. Using a motor driven drilling equipment for sampling data-

ble material, especially charcoal for Radio-Carbon-analysis, the ramparts of several hillforts in Lithuania and Russia have recently been investigated. The results also give additional information about the inner structure of the ramparts.

The paper gives an overview on the methodology and presents first results of the recent investigations of hillforts in the Kaliningrad Region of Russia.

7 ON THE CONSTRUCTION OF SLAVONIC STRONGHOLDS AND THEIR RAMPARTS

Author(s): Messal, Sebastian (German Archaeological Institute)

Presentation Format: Oral

Among the most impressive monuments of early and high medieval settlement in the south-western Baltic region, are undoubtedly Slavonic strongholds, which constitute a dense network in the area between the Rivers Elbe and Vistula. These strongholds were preferably built within natural protective locations: e.g. on mountain spurs and on steep slopes (hill forts), in lowlands or on islands. The ramparts were built of wood and earth, whereby simple plank wall constructions as well as complex wooden installations like timberlaced and box constructions could increase the stability of the rampart embankments. As a result, high and steep-walled fortifications were created, which were difficult to attack and enabled an effective defense, especially since additional wooden wall-walks were probably built on the ramparts. The paper should give a brief overview on the constructions of several, well-excavated Slavonic strongholds to enable a discussion about dating and distribution of different building techniques within the north-western Slavonic region.

8 FROM INTERNAL STRUCTURE AND TO POSITION IN THE LANDSCAPE. AIRBORNE REMOTE SENSING OF FORTIFIED SITES

Author(s): Jarockis, Romas (Association of Lithuanian Archaeology; Vilnius Academy of Arts)

Presentation Format: Oral

Survey of aerial images and LIDAR data have been most intensively applied airborne remote sensing methods in the field of archeological research for several decades. The use of these methods for archeology has some advantages that should be mentioned - it is the quickest and non-destructive source of information on the scale of single archeological site and particular segment of cultural/archaeological landscape.

Research of fortified sites in Lithuania was carried out with the help of descriptions based on the results of field survey which was done in more or less professional and scientific manner since the beginning of the 20th century. The aim of this presentation to demonstrate how remote sensing techniques could be applied to survey Prehistoric-Early Medieval fortifications which are taken on historical aerial photographs. The scale, construction and position in the cultural landscape of fortified archaeological structures seen in the Second World War provides an ideal basis to compare how they were modified during the course of time. It will be worth not to be mentioned that application of airborne remote sensing methods and techniques provide an effective and low-cost instrument for the scientific investigations.

9 THE DEFENSIVE SYSTEM OF HILLFORTS: THE CASE OF ENVIRONMENT TRANSFORMATIONS IN KERNAVĖ, THE HISTORICAL CAPITAL OF LITHUANIA

Author(s): Velius, Gintautas - Vengalis, Rokas - Kuncevicus, Albinas - Poskiene, Justina - Volungevicius, Jonas (Vilnius University)

Presentation Format: Oral

Kernavė archaeological site encompasses diverse archaeological objects from different prehistoric and medieval periods. The site is under investigation over 40 years. Kernavė is a place of exceptional significance in the context of history of Lithuania's statehood – the residence of the Grand Duke, the impressive defensive system of hillforts, the town of craftspeople and merchants were situated there in the 13th–14th centuries.

During the past year, an interdisciplinary research focused on the group of five hillforts. It was carried out in the framework of the scientific project "Landscape of the Statehood: Environment Transformation in the Historical Capitals of Lithuania" (supported by the Research Council of Lithuania). The following research strategy was applied: systemization and synchronization of the archaeological data on paleorelief and its change; application of non-destructive and minimally destructive field research methods aiming to examine environmental transformations, as well as the scale, character and chronology of earthworks. Geophysical non-destructive (GPR, magnetometer) and minimally destructive (power auger and hand auger boreholes' survey, archaeological test pits) field methods were applied. Paleopedological research was carried out: evidence obtained by non-destructive methods and boreholes' data were interpreted in regard to paleosoils and the circumstances for the development of the defensive landscape were revealed. Precise chronology was obtained by C14 AMS method.

The ultimate goals were to indicate the chronology and process of the Iron Age settlements' fortification; to ascertain the chronology and circumstances for the establishment of the integral defensive system of hillforts; to reveal the scale and character of the earthworks (e. g., setting out ditches and ramparts), which were carried out in order to transform the environment in Kernavė, the historical capital of Lithuania.

10 MULTIVALLATE HILLFORTS OF THE IRON AGE IN THE EASTERN EUROPEAN PLAIN

Author(s): Chaukin, Sergey (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

A large number of hillforts protected by three lines of ramparts were uncovered in the vast area of forest zone in the Eastern European Plain. On the territory from the river Western Dvina on the West to the Nizhniy Novgorod region's part of the river Oka on the East there are data about the presence of fortifications in 576 settlements. Among them 278 sites have one line of ramparts, 145 – two lines and only 79 – three lines. The last group consists 8-10% from the total number of the Iron Age sites. Except the Iron Age the layers belonging to the 3rd quarter of the 1st millennium AD are fixed on these sites.

Multivallate hillforts form several clusters on large rivers – the Volga, the Oka, the Moskva-river, the Ugra, the Sozh, the Kasplya. The cluster, located in Zvenigorod part of the Moskva-river's middle flow, between the mouths of the river Ruza and the river Setun, is mostly investigated in detail. Here 8 settlements with three lines of ramparts were fixed: Lutsino, Savvino-Storozhevskoe, Dunino, Uspenskoe, Barvihinskoe, Znamenskoe, Dyatlova, Kuntsevo. All of them are situated on the distance of 5-7 km from each other.

Most of settlements with three lines of ramparts are related to several types. The type 1 is multivallate hillforts on narrow elongated capes, located on small rivers, not far from their mouths. There are many hillforts of this form in the middle flow of the Moskva-river. The type 2 is round hillforts with ring ramparts. They are mainly situated in the Western regions of the Eastern European Plain.

There is still no answer to the question about the purpose of this type of sites. There are several versions of its interpretations: clusters of multivallate hillforts mark «local centers» requiring more protection; multivallate hillforts are worship objects.

11 FROM THE TECHNICAL FEATURES OF FORTIFICATIONS TO POLITICAL MEANINGS : A MONUMENTAL ENCLOSURE FROM THE SEINE VALLEY, FRANCE

Author(s): Poirier, Sandy - Ravry, Delphine (Eveha) - Ferrier, Antoine (Conseil Général de l'Aisne)

Presentation Format: Oral

The site of La Villeneuve-au-Châtelot is located in the Seine Valley, northeastern France. Starting in 2013, developer-funded excavations at this large site, which is part of a wider network of enclosed neolithic sites that extend over more than 4 km², have fully excavated almost 20 ha, mostly in the inner-space of the enclosure. The site was fortified by a single wood fence or wall which encloses a very large area, probably between 45/50 ha. More than 450 fragments of the wooden planks - extending over 725 lm - making up the palisade were well preserved in situ due to the wetland environment.

In this paper, we first present the methodological challenges of identifying, excavating and recording a fortification on this scale, with the second part discussing the structure in detail. This includes details of both the natural resources exploited and technological aspects used to construct the structure : how were the individual wooden planks shaped and joined together, how were the planks put in place (with 9 tons of broken millstones re-used as shimstones); and what was the form of the enclosure, including its gateways, interruptions, and overall layout ? Then, we place the wider enclosed site into the landscape, starting with the small scale (the topography of the enclosure), and expanding to show its relationship to other enclosed sites within the vicinity. In this way, the history of fortification, as both physical and political boundary, can be highlighted.

12 BUILDING HILLFORT: SOCIAL MEANING OF FORTIFIED SITES IN IRON AGE LATVIA

Author(s): Sne, Andris (University of Latvia)

Presentation Format: Oral

As distinctive component of past and present landscape, hillforts had raised permanent attention from both researchers and public during the last centuries. In Latvia, hillforts of Late Iron Age (or 'long Viking Age') had become part of collective memory that partly might be explained by their impressive outlook, especially fortifications. So, for example, they played prominent role in public discourse and national propaganda in 1920s and 1930s symbolising glorious pre-Crusade past while also later they often were viewed as centres of political power and seats of local petty-kings. The number of discovered hillforts in Latvia (close to 500 sites) is constantly increasing due to recent advances in surveying and usage of LIDAR data that allows identifying artificial modifications even in deep forests and remote areas. Beginnings of hillforts in territory of present-day goes back to the Late Bronze Age and Pre-Roman Iron Age but most of hillforts (more than half of them) were used in later prehistory. There are numerous hillforts with elaborate defence systems including several moats and earthen ramparts (up to five) and revealing intensive cultural layer during archaeological research. Some of them have large adjacent settlements and their inhabitants were actively involved in craft and trade activities, becoming similar to early towns. On the other hand, there are numerous sites with remains of fortifications but without traces of long-term human inhabitation. Recent research in Iron Age Grobina Hillfort even allows concluding that initially it was small peninsular settlement and only in following centuries it was remodelled as higher location of fortified site. Therefore, these sites, which currently are labelled as hillforts, share their common feature – fortifications, while their functions in Iron Age were much more diverse and different, and presumable most of them were used as non-settled sites, like communal or refuge sites, military forts, households.

CHANGING THE MEANING. THE STUDY OF A WALLED STRUCTURE IN THE ANDES

Author(s): Balbi, Jose (Colchester Archaeological Group; Ministerio de Cultura y Educación, Buenos Aires) - Buffalino, Eduardo (ISFD - Instituto Superior de Formacion Docente) - Cristofaro, Ilaria (University of Wales Trinity Saint David; Osservatorio Astronomico Sirio, Castellana Grotte)

Presentation Format: Oral

Our work presents the an Inka temple located in the most important city south of the capital of the Empire, Cuzco. However, the structure has been known for several years and it is part of an archaeological park visited touristically.

The archaeological work led to understand the change of function that corresponds to this structure, which was always considered a military fortress and that even in the official story is called El Atalaya (The Watchtower), a designation that goes together with a series of stories that describe Inka soldiers guarding a road or access to the sacred city that is located near the structure.

"The Watchtower" is a structure built on a hill with the visible remains of a double wall, had supposed the existence of some kind of fortress, without mention that the Inkas, to indicate a sacred place, built structures of stone around them and that these walls did not have defensive functions.

The excavation of the "Atalaya", carried out between 2015 and 2018, ended by indicating the existence of a ceremonial furnace, dumps, and other sacred elements that confirm that the structure was a temple. Even the falling stones of the surrounding wall were calculated, determining that its height did not make sense as a defensive structure. Our archaeological research determined that the structure is a Temple.

"El Shincal de Quimivil", located in Argentina, was an important Inka administrative and religious center, it was excavated and studied from the 60's to the present day.

The popular idea remains and because of its appearance, elevated and with its stone wall, even today the guides and the visitors of the archaeological site agree to imagine soldiers stationed behind the walls waiting for an attack that could never have happened. Today we can scientifically explain the truth.

BUILDING BLOCKS AND BINDING AGENTS - SOCIAL AND LANDSCAPE IMPACT OF STONE BUILDING IN THE ALPS

Theme: Archaeology of mountainous landscapes

Organisers: Hueglin, Sophie (Newcastle University; Foundation Pro Monastery St John) - Cassitti, Patrick (Foundation Pro Monastery St John) - Villa, Luca (Independent researcher)

Format: Regular session

Alpine landscapes provide many constraints on travel, agriculture, and other relevant aspects of societies. Its inhabitants have adapted to the fractured geography, especially its vertical component, by adopting cultural and economic practices such as the transhumance of livestock. The culture of building and construction is deeply influenced by the characteristics of the alpine landscape. In this sphere, too, the vertical component is important, and carries a strong ideological and religious significance.

Stone is an ubiquitous raw material in the Alps. Nonetheless, in many regions wood was the predominant building material for farms and houses. High-status buildings were constructed of stone and mortar. The introduction of these materials, particularly mortar and plaster, in building seems to also have caused changes in the mind set of societies. Stone and mortar construction techniques increase the visibility of man-made structures and therefore have an impact on the landscape. The combination of building material and geographical features carries often religious and ideological connotations which change over location and time.

We invite archaeologists, historians, engineers and representatives of other disciplines to present and compare their studies on alpine sites from all prehistoric and historic periods. We want to look at materials, methods, movements and motivations of builders, patrons and users. Within this session the papers should address one or better some of the below aspects:

- characterise building materials and methods
- confirm or contest conventional dating
- contextualize changing resource availability
- compare contemporary description and observable practice
- comprehend choices and their pragmatic and symbolic motivations
- clarify impact of stone building on society and landscape.

ABSTRACTS

- 1** **WOOD AND STONE: BUILDINGS IN THE LANDSCAPE OF THE SOUTHERN FRENCH ALPS SINCE THE END OF THE PREHISTORIC PERIOD**

Author(s): Shindo, Lisa (Aix Marseille Univ, CNRS, CCJ, Aix-en-Provence; Aix Marseille Univ, Avignon Université, CNRS, IRD, IMBE, Marseille) - Mocci, Florence (Aix Marseille Univ, CNRS, CCJ, Aix-en-Provence) - Talon, Brigitte (Aix Marseille Univ, Avignon Université, CNRS, IRD, IMBE, Marseille)

Presentation Format: Oral

Since almost 20 years, a French and British team is doing archaeological, dendrochronological and anthracological studies on buildings in the Southern French Alps between 1200-2400 m. The aim is to gather information about traditional building practices and to specify long-term changes in the relationship between human societies and forest management.

In the higher altitudes, between 2070-2360 m, the appearance of stone-built structures and perishable materials is attested from about 2500 BC - 400 AD by radiocarbon dating. Only the base of the walls, consisting of clusters of uncut and unbound shale blocks is conserved (F. Mocci, K. Walsh). The material composition of walls and roof of the domestic space – probably constructed in perishable materials – can be understood from anthracological analyses of burnt remains (European larch, stone pine, B. Talon).

On lower altitudes, between 1200-2060 m, we have studied timbers from about 100 archaeological sites (J.-L. Edouard, L. Shindo). The most important buildings are houses with stables for animals in the lower stone floor. The barn is often incorporated in the house as upper floors, mostly made from wood. This lighter material allows to create many openings which helps with hay drying. Several wood building methods were identified: trusses, 'blockbau', half-timbering, ceiling with joists, French ceilings. These timbers are made from local species (Scots pine, European larch, fir, stone pine). Two major wood building phases were identified: 10th-14th and 15th-20th centuries AD. The hiatus in the second half of the 14th century could be linked to the historical "disruptions" which had negative consequences on demography.

Stone as the more durable material was used at least for footings from the beginning. Likewise, European larch and stone pine were employed throughout. Therefore, in this mountain area, building materials were utilized depending on local availability and on their properties.

- 2** **TOWARDS A LOCAL DISTINCTIVENESS IN VERNACULAR ROMAN ARCHITECTURE. A THEORY OF REGIONAL DIVERSITY**

Author(s): Kienzle, Peter (LVR Archaeological Park Xanten)

Presentation Format: Oral

Architectural history traditionally focused on the big three: church, castle, palace (meaning: religious, defensive and representative buildings). Traditional vernacular buildings such as farmsteads, workshops, barns and civil houses have been marginal within the scope of research. A small group of researchers, frequently connected to farmhouse open-air museums, established the sub-discipline of "Hausforschung". The scholars identified regional diversity in vernacular architecture based on a set of basic issues such as availability of material (mud, clay, timber, stone,...), climatic conditions (hot, cold, stormy, rain, snow,...), economic system (farming, cattle breeding, manufacturing, ...), legislation (building laws, heritage laws, ...) etc. Due to these issues particular housing landscapes developed as far as vernacular buildings are concerned while religious, defensive or representative buildings stick to more general plans or fashions.

In Roman archaeology research has focused on important buildings (temple, bath, place, city walls, ...) while local houses played a lesser role. However, to date a lot of individual houses from Roman times have been excavated and the results published in local or national journals or books. Frequently, houses from other parts of the Roman Empire are employed to interpret missing or questionable parts of the excavated structure disregarding if these buildings are comparable in terms of climatic condition, availability of building materials or economic system. This contribution argues, that by now it should be possible to put forward an idea of regional differences within vernacular Roman archaeology based on the principles developed by the "Hausforschung" of traditional houses in central Europe. A long term goal may be the creation of a map of regional Roman vernacular building landscapes.

- 3** **FORTIFICATIONS OF THE EASTERN ALPS BETWEEN LATE ANTIQUITY AND EARLY MIDDLE AGES**

Author(s): Villa, Luca (Associazione Nazionale per Aquileia)

Presentation Format: Oral

Archaeological research of the last decades has brought forward new evidence on the construction modalities that characterize late Antique and early medieval fortifications of northeastern Italy. These observations were made in urban or rural sites, with or without settlement context, but concern in particular settlements which are situated on hill tops. The evidence allows to differentiate between systems and ways of building that derive from local traditions and examples that refer to new concepts of fortification imported from the outside.

The analysis of some of the most significant examples, including some unpublished material from the Friuli region, will allow to draw a provisional conclusion, about trends in the evolution of building techniques in a period of transition between Late Antiquity and the early medieval period. The examples presented will include both architectural typologies and techniques as well as

building materials of the fortifications themselves and of other elements of the settlements.

4 THE CAROLINGIAN CONSTRUCTION SITE AT THE MONASTERY OF ST. JOHN, GRISONS, SWITZERLAND

Author(s): Cassitti, Patrick - Neukom, Hans (Foundation pro Monastery of St. John)

Presentation Format: Oral

The World Heritage site of Münstair, Grisons, Switzerland, is one of the best studied monasteries in Europe, thanks to decades of archaeological research. Founded in Carolingian times, it has maintained its original function as a monastic site. Thanks to this long history, the monastery complex comprises buildings from many different eras between the late 8th and the 20th century. The proposed paper will focus on the earliest construction phase, which has been dated by dendrochronology to around AD 775. A large number of archaeological features can be attributed to the Carolingian construction site: trenches, post-holes, fills, as well as imprints on soil and mortar. They offer insights into the organization of the building site and the progression of the work. Petrographic analyses on mortars and raw materials from Münstair are currently being carried out. They will complement and expand our knowledge about Carolingian building techniques at the site. Some preliminary results from these analyses will be presented in the paper.

5 MECHANICAL MORTAR MIXING AT MÜSTAIR MONASTERY: EARLY MEDIEVAL INVENTIONS IN BUILDING TECHNOLOGY

Author(s): Hueglin, Sophie (Newcastle University; Foundation Pro Monastery St John, Muestair)

Presentation Format: Oral

Throughout the Roman and medieval period, 'machines' like cranes were used on major building sites. But mortar seems to have been exclusively mixed by hand, i.e. with hoes and shovels. An exception is the period between ca. AD 650-1050 when simple mechanical devices were developed across Europe allowing for the mortar to be prepared in pits with a mill-like turning device that could be operated by humans or by draught animals. These devices seem to have been used rather in remote places and in pioneer situations than in urban centers with continuous stone building tradition (Hueglin 2011 & 2017).

Extensive archaeological excavations around the Abbey of Saint John at Münstair in the Swiss Alps have brought forth remains of altogether six mortar mixers from two building phases. With this, the ancient Benedictine monastery – declared a UNESCO World Heritage site in 1983 – boasts the highest number of mortar mixers when compared with – currently – forty plus other sites across Europe. The Carolingian example – with a diameter of 3.20-3.40 m one of the largest devices – is from around AD 770-790. The other five – with diameters of ca. 1.90 m much smaller – cluster around the so-called Planta tower, one of the oldest fortified residential towers in the Alps, added to the monastery around AD 960. The current SNF-project "Mortar Technology and Construction History at Münstair Monastery" is addressing the question about the specific uses of these mechanical devices.

6 PETRIFICATION FOR REPRESENTATION: CASTLE BUILDING IN THE ALSATIAN VOSGES MOUNTAINS (AD 900-1300)

Author(s): Koch, Jacky (Archeologie Alsace) - Mechling, Jean-michel (Institut Jean Lamour – Université de Lorraine – UMR 7198 Dpt CP2S, Equope « Matériaux pour le Génie Civil », Nancy)

Presentation Format: Oral

"It is said that around the year 1200 ... There were only few forts and castles ... There was rarely used, for their construction, stones of any price ..." (Chronicle of Dominicans of Colmar - 1300). From the end of the Hungarian invasions in the second third of the 10th century until 1300, on the east side of the Vosges Mountains dozens of castles were constructed. Their plans and shapes were very diverse. Mostly placed on summits and visible from the Rhine plain, these buildings combined the functions of private residence with public protection. Their walls were designed to meet this dual need. This profusion is explained by a complex historical context and furthermore it benefited from the availability of a wide range of local geological resources. The direct extraction on site or nearby gives stone a major role in aesthetic aspects as well as in the way it was used. As an "old" mountain massif, the Vosges offered many different types of rock that permitted to shape all kinds of blocks, from rubble stone to big ashlars. This technical advantage allowed for many design variations. Around AD 1200, political and social fragmentation leads to a further densification of the building sites. It created economic competition between two types of monumental architecture: firstly the use of rusticated masonry (named "blocs à bossage" resp. "Buckelquader") as a specialty of the stonemasons, and secondly the use of rubble stones and mortar with new techniques that made masons indispensable. This second type of construction necessitated to understand how to interlock different stone layers by binders and can be observed on residences of ministeriales as well as at royal fortresses. Recent researches on this theme confronted field and geological data, especially by studying of binding agents.

A. SHEPHERD HUTS, SHELTERS AND PENS. DATED AND UNDATED DRYWALL STRUCTURES AT HIGH ALTITUDES IN EAST TYROL

Author(s): Waldhart, Elisabeth - Stadler, Harald (Insitut für Archäologien Innsbruck)

Presentation Format: Poster

Since 2008, members of the Institute of Archaeology at Innsbruck University have studied anthropogenic drywall structures in East Tyrol. These structures are situated at an altitude of about 1800-2400 meters. The excavation of sites brought forward

objects and features which range from the Early Bronze Age with some interruptions to the 20th century. These discovered structures were used for different purposes: they served as shepherd huts and shelters, as pens for counting goats and sheep, and as elongated rectangular shelters for cows and small livestock. The rectangular shelters had a wooden lean-to roof covered with wooden shingles, whereas the roof construction with the other drywall buildings is mostly unknown. Depending on the dating evidence and the preservation status, often ethnological and historical comparisons have to aid reconstructions. Another problem is posed by the stone walls which were mentioned in post-medieval written sources. These stone walls functioned as border between the various real estates which were owned by different alpine farmer's cooperatives. It continues to be difficult to figure out with archaeological methods age and function not only of the stone walls but also of some of the other structures.

B. THE RURAL ARCHITECTURE OF THE MEDIEVAL SETTLEMENT IN THE MIDDLE MOUNTAINS OF CANTAL AND SANCY (MASSIF CENTRAL, FRANCE)

Author(s): Surmely, Fred (DRAC ARA) - Franklin, Jay (Shumla Archaeological Research & Education Center)

Presentation Format: Poster

Since 2000, we have taken interest in the medieval peopling of the low mountain ranges in the Auvergne region of France. We selected two zones of studies: the first in the south of the Cantal Department where we conducted the largest part of our research and the second in the south of the Sancy Massif, beginning in 2013. Our work consists of survey, cataloging, testing, and paleoenvironmental analyses. Two broad categories of structures were recorded. The first corresponds to large elongated structures with stone walls. Our research indicates that these occur either as isolated farms or grouped in small hamlets, occupied most probably year-round within a framework of agro-pastoral exploitation of the landscape. These structures were semi-subterranean and carefully protected against the cold. They date to the period between the end of the 10th and the 12th centuries. In one hamlet, all houses were stone built, except for one, which was built with wood.

From the 13th century, the local economy saw a profound transformation, with generalized seasonal cattle breeding. Permanent occupation ceases and the big stone structures are replaced by small square structures which were used as shelters and shepherds' sheds. These sheds were transformed and improved during modern era.

304 ARCHAEOLOGY FOR THE PUBLIC: DEVELOPING MODELS AND TOOLS FOR ASSESSING PUBLIC OUTREACH IN ARCHAEOLOGY

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Thomas, Ben (Archaeological Institute of America) - Soininen, Tuija-Liisa (Pirkanmaa Provincial Museum)

Format: Regular session

Join an ongoing discussion of archaeology and public engagement that started at the 2018 EAA meeting in Barcelona. In this session we will present and build on the results of the 2018 session that provided an overview of various outreach methods and useful evaluation and assessment practices that have already been developed in various countries. We will share ideas, consider the preparation of a statement of ethics and a set of guidelines for practitioners, discuss the effective implementation of evaluation and assessment for the programs, and continue to expand the support network for archaeological outreach that we initiated in Barcelona. We want to hear from individuals, organizations, museums, historical societies, state and federal agencies, and private foundations around the world that are involved with archaeological outreach including programs that inform and educate the public about archaeology in non-academic or informal settings. What types of programs do you organize? What are the goals of these programs? What are the issues and challenges you face? How do you evaluate the success of your programs? We hope that this discussion will allow us develop a robust approach to public outreach and engagement.

ABSTRACTS

1 ARCHAEOLOGY ALIVE - GROWING PLATFORM WITH INSPIRING OUT OF THE BOX 'ARCHAEOLOGY SUCCESSES', INTERVIEWS AND TOOLS FOR REACHING THE PUBLIC

Author(s): Berkelbach, Janneke (Nationale Archeologiedagen)

Presentation Format: Oral

How do we successfully reach our public and make archaeology come to life... for everyone? With this question in mind we have set up Archaeology Alive, a Dutch growing, developing platform for and about the archaeological world (www.archeologieleft.nl). Our aspirations are to inspire each other by sharing out of the box 'archaeology successes', interviews, and tools for organizing an archaeological public event. By joining together and crossing boundaries with other disciplines, we aim to embed archaeology into our society because we believe different points of view stimulate inspiration.

Archaeology successes. Our 'archaeology successes' are national and international examples of inspiring public activities involving archaeology. These activities are usually realized in close cooperation with other cultural disciplines, such as fashion, technology, arts & crafts and design. How can poets, refugees, cooks and a local pastor contribute to archaeology? Sharpen your senses: you can now see, taste, hear and feel the past.

Interviews, inspiration and tools. Curious about how others reach their audience? Read interviews with international and national

adventurous archaeologists, artists and other innovative and creative thinkers. In our 'inspiration' section you find enthusing projects like international film festivals or international archaeology events. And most definitely, do not try to re-invent the wheel by yourself. Different tools are available to help organize your own activities. Are you eligible for a subsidy? And how can you get teenagers and youngsters involved with your project? How do you get the press involved? You can find answers to these and more questions in our 'Tools' section.

Archaeology Alive is an initiative of foundation National Archaeology Days, a yearly weekend-long event in the Netherlands with hundreds of archaeological activities for a wide audience.

2 **ARCHAEOLOGY NIGHT - AN EVENING FILLED WITH ARCHAEOLOGY, THEATRE, SPOKEN-WORD, VIRTUAL REALITY AND FASCINATING TALKS AND WORKSHOPS BY YOUNG ARCHAEOLOGISTS**

Author(s): Berkelbach, Janneke (Nationale Archeologiedagen)

Presentation Format: Oral

In 2018 the first Dutch 'Archaeology Night' took place in the Dutch Royal Museum of Antiquities (www.archeologiedagen.nl/archeonacht). It was initiated by the Dutch foundation, the National Archaeology Days and aims to become an annual event.

Archaeology Nights are evening-long programs of workshops, tours, performances, Virtual Reality and fascinating talks by young archaeologists. The focus is to attract a younger and wider audience to archaeology. To achieve this goal we believe in programming not only for, but also by youngsters. Therefore the Archaeology Night was programmed by a recently founded platform and think tank of young professionals united by their work and interest in public archaeology, called the Young Underground Professionals.

For Archaeology Night, the Young Underground Professionals aim to create a program in which the boundaries between archaeology and other disciplines, such as spoken word, literature and theatre, are crossed. The idea behind this is that archaeology has so many beautiful stories to share and art, performance and other cultural expressions could provide the emotional 'touch' with which to tell these stories.

3 **ARCHÄOMOBIL. ARCHAEOLOGY ON THE ROAD**

Author(s): Pfenninger, Franziska (Verein Archäologie mobil) - Schaeppi, Katharina (Kantonsarchäologie Schaffhausen)

Presentation Format: Oral

Archaeology is fascinating! It brings pictures of ancient temples, pyramids and gold to mind. But what about local archaeology? Only rarely do excavations at one's doorstep unearth superlatives. The facts and stories they bring to light are equally interesting, though.

After severe cost cuts in some archaeology departments the question arose about how we could convey the importance of a science that is almost invisible and not obviously relevant to daily life to the public?

Inspired by three similar projects in other countries the idea of the Archäomobil was born. On the occasion of the European Year of Cultural Heritage 2018 the archaeology department in Schaffhausen in collaboration with the association "Archäologie mobil" (mobile archaeology) set up a pilot project. To start with, the archaeology department's transport van was given a new look. Shovels and other tools had to make room for an unusual load: 26 boxes full of artefacts, one for every municipality of the canton. Archäomobil's tour involved five official stops at schools as well as public spaces. Local communities were invited to visit the Archäomobil, talk to archaeologists and have a unique look at artefacts usually stored away in a depot and not publicly accessible.

The project's aims were to:

- display artefacts at the sites they were originally found, some of them many years ago.
- make local archaeology visible and tangible.
- convey knowledge and share results from the forefront of research
- get in touch with people who don't (often) go to museums.

In my talk I will present our project, reflect on experiences and problems we faced and discuss upcoming challenges and opportunities.

4 **ADOPT A MONUMENT - NEW INITIATIVES AND DEVELOPMENT PATTERNS**

Author(s): Soininen, Tuija-Liisa (Museum Center Vapriikki, Pirkanmaa regional museum services)

Presentation Format: Oral

Adopt a Monument Finland was awarded the Europa Nostra Grand Prix in 2016. The program involves nowadays more than 3000 volunteers in Finland. The Finnish program has been developed since 2008 as a method of soft protection adapted particularly to Finnish needs and situations. The Adopt a Monument scheme can easily be adjusted to different circumstances and situations. It is the user-friendliness and the profound idea of creating resources and wellbeing simultaneously that makes it attempting and easy to market. In autumn 2019, Adopt a monument Finland is making new steps. If the financial outcome will be satisfactory, there will soon be an international help desk by the adopters and program organisers of three countries; Ireland, Scotland and Finland. This can be a new start in enabling adopters and organisers every where to be able to form their own Adopt a monument program. The portal is planned to consist the stories of the adopters as well as organisers. There one may pick up the best prac-

tices of certain country, the list of adopted sites with their management plans, lots of practical and ethical advice and other useful information. One of the core ideas of Adopt a monument is that there are many reasons why people do participate and many of those are not necessarily related with heritage protection. Sometimes more important than concentrating on the maintenance; finding the right sites may be to find the right people or position you as an organiser where the right groups of people will find you. Sometimes it's crucial just to set up a platform where those people can meet whether in actual place or even in online.

5 LOCAL ARCHEOLOGICAL MUSEUMS – MOSCOW REGION EXPERIENCE

Author(s): Guseva, Anastasia (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

There are magnificent museums in Moscow, full with masterpieces, but small local museums maybe not so rich with masterpieces but can tell interesting stories about local history, collect historical facts about the nationhood based on archeological and ethnography, save artefacts from storing in storages of big museums and be seen by everyone. Also local archeological museums are usually created on a places of archeological sites. So the museum creation process includes well co-ordinated work of archeologists, conservation team, museum workers and government representative.

Finally, it is more important to develop a dialogue not only with Moscow city government, but also with local citizens, who are more concerned about their local landscape than we could think.

The paper will be filled with examples of new local archeological museums in Moscow region in different neighborhoods both in city center and city outskirts. As a conclusion would be made an algorithm how to release a local archeological museum.

6 ARTEFICTION. THE POWER OF STORIES IN ARCHAEOLOGICAL OUTREACH

Author(s): Dielemans, Linda (Artefiction)

Presentation Format: Oral

Getting an audience to engage with archaeology is a difficult job. The theory and practice of it are not always as attractive to people as we might wish. In this paper I propose the use of fiction to communicate archaeological research. I will argue this through examples from my own experience as an archaeologist and author of children's novels. These two occupations may seem contradictory, representing facts versus fantasy, but I hope to show that fiction is not necessarily a replacement or distortion of science, but rather an easy and engaging road towards it. By writing adventurous novels, I challenge a large audience, mainly children, to look beyond the story and discover the archaeological framework the story is built on. I try to achieve this by providing an explanatory afterword, additional information on my website, and school class visits. To evaluate the impact of my work, sales numbers and library loans are good indicators, as well as online presence. For this paper, I have also made use of an online survey to assess the reader's willingness to actively search for more details about the archaeology behind the stories for themselves.

7 MIGRATING PEDAGOGIES : A CASE STUDY IN SOCIALLY ENGAGED ARCHAEOLOGY

Author(s): Stevens, Fay (University of Notre Dame - U.S.A. - in England)

Presentation Format: Oral

This paper presents the outcomes of a new course in socially engaged archaeology taught at The University of Notre Dame (U.S.A.) in England. It considers why socially engaged archaeology is important and explores the contribution such an approach can make to the discipline and beyond. Themes include issues of voice, reflexivity, identities and a pedagogy of curation. This discussion will focus on research and collaboration with the Museum of Migration, London and will make reference to student engagement with the museum and resulting research and outcomes. The focus of attention will be on the exhibition 'Room to Breathe' and will draw upon student responses to the exhibition, engagements with exhibition contributors and collaboration with the museum curators. This will lead to a closer consideration on the topic and relevance of socially engaged archaeology as well as adopt a wider discussion on the philosophy of socially engaged archaeology and stories of migration.

8 PEERS, PARTNERS, AND MENTORS: ESTABLISHING A NETWORK OF HERITAGE EDUCATORS

Author(s): Thomas, Ben (Archaeological Institute of America)

Presentation Format: Oral

At the 2018 EAA meeting in Barcelona, participants in a session on Archaeology and Public Engagement presented overviews of various outreach methods and useful evaluation and assessment practices that have been developed in various countries. One of the topics that emerged in the discussion that followed was the need for the creation of a network of professionals engaged in the creation and presentation of outreach activities. In this paper the author presents the results of a series of workshops and conferences for heritage educators that were organized by the author and his colleague and conducted around the United States. The author discusses the issues involved with the organization of these meetings, the topics that were discussed at the various gatherings, and the results of these efforts. Issues discussed at the meetings included the lack of a statement of ethics governing the creation and implementation of outreach efforts, the need for general guidelines to assist practitioners, and the ability to access a network of peers for consultation, partnership, and mentorship in addition to general support. The author hopes that through this presentation, we will be able to discuss the feasibility of expanding the support network internationally in an ongoing effort to create a robust and collaborative approach to public outreach and engagement.

A. COMMUNITY ARCHAEOLOGY IN ZUOYING OLD CITY SITE, TAIWAN

Author(s): Wang, Bo-Chiao - Liu, Yi-Chang - Chung, Kuo-Feng (National Cheng Kung University, Institute of Archaeology)

Presentation Format: Poster

Zuoying old city site located in southern Taiwan. It contains materials from almost every period in Taiwan history, from Neolithic to modern days. The settlement surrounding the site also has residents with different backgrounds and identities.

In 2016, National Cheng Kung University (NCKU) archaeological team started a series of community-based archaeological programs. It is the first community archaeology attempt in Taiwan, and even though there are experimented archaeologists in the team, they are doing something that has never been done before. Nowadays, the archaeological fieldworks in Taiwan increasingly tend to be conducted as salvage archaeology. It does so because rescue archaeology provides most of the budget. In reaction to that, the archaeologists in NCKU are now aware of the necessity of defining other values for Taiwan archaeology than economic ones, to truly benefit modern Taiwan communities. However, since it is a new approach in Taiwan, community-archaeology program has proved to be quite challenging: archaeologists are facing a much more anthropology-like methodology they are not familiar with, and increasing spending (both in money and in time) compare to a standard salvage archaeological program.

Is community-based archaeology approach a way to bring new value to modern archaeology? What is the strategy we need when facing local communities with divergent interests? What could we do when local authority (also the sponsor of the program in this case) are making extra and unrealistic demands? Should we persist or make compromises when community archaeology appears to be too costly?

This research not only aims to present both the complexity of the site and of the community around it, but it also intends to reflect the ideas lying behind this archaeological program., by presenting the conflicts and the endeavors in archaeological works, and what do we think the community-based archaeology can bring to modern Taiwan.

305 ROUNDTABLE CLIMATE CHANGE AND HERITAGE (CCH)

Theme: Global change and archaeology

Organisers: Biehl, Peter F (University at Buffalo, SUNY) - Dalen, Elin (Riksantikvaren/Directorate for Cultural Heritage) - Martens Vandrup, Vibeke (Norwegian Institute for Cultural Heritage Research - NIKU)

Format: Round table

This third roundtable organized by the EAA Community Climate Change and Heritage (CCH) has two main objectives: (1) to provide an update on the work done in and by the community since the Barcelona meeting including a CCH action plan – to be circulated prior to the meeting -, and (2) to discuss ways to translate fundamental archaeological research into actionable science to inform decision making as well as monitor climate change as it relates to archaeology and heritage. We will invite representatives of key archaeology associations such as the Archaeological Institute of America (AIA), Society for American Archaeology (SAA) and World Archaeological Congress (WAC) and others as well as specialists in climate change and heritage research as a sounding board for the EAA Community Climate Change and Heritage (CCH) action plan as well as opinion leaders in methods and practice of climate change and heritage research. It is also planned to discuss a ‘Bern Declaration for Climate Change and Heritage’.

307 UNVEILING INVISIBILITY: EXPLORING KNOWLEDGE , INTERDISCIPLINARITY AND IDENTITY THROUGH THE HISTORIES OF ARCHAEOLOGICAL COLLECTIONS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHF-Ci-UE-FCSH-Universidade NOVA de Lisboa; InterArq Project, Universitat de Barcelona) - Coltofean, Laura (Universitat de Barcelona; InterArq Project, Universitat de Barcelona) - Garcia-Ventura, Agnès (Juan de la Cierva-Incorporación, IPOA-Universitat de Barcelona) - Díaz-Andreu, Margarita (ICREA and Universitat de Barcelona; InterArq Project, Universitat de Barcelona)

Format: Regular session

Archaeological collections are invaluable sources for reconstructing different aspects of the histories of archaeology. The study of archival documents, publications and newspaper articles related to the constitution and later evolution of such collections brings us insights into the development of archaeological theory and practice, the emergence of interdisciplinarity, as well as into the production and circulation of scientific knowledge across time. It also reveals the potential and role of archaeological collections in identity construction, and in shaping various types of networks and power relationships within the discipline of archaeology.

This session aims to unveil the invisible stories behind both private and public archaeological collections in Europe and beyond, from the nineteenth to the twentieth century. We welcome papers that explore topics such as the agendas and ideologies behind collecting, researching and exhibiting archaeological objects and collections; the scientific narratives built around collections; the contribution of collections to the evolution of archaeological interpretations and to fostering pluri- and interdisciplinary collaborations and investigations; the role(s) of collections in the production, transfer and exchange of knowledge, as well as in building local, regional and national identities. We would also like to encourage discussions about the hierarchies and networks (e.g., social, academic) that were formed around collections between locals, collectors, amateurs, and professionals, in addition to their involvement in the birth and development of archaeological societies and museums.

Following the EAA2018 session “Archaeology and interdisciplinarity & interdisciplinarity in archaeology: stories of a long and diversified journey (19th-21st centuries)”, this proposal also aims to get a broader and more detailed picture of some aspects of the research project ‘InterArq-Archaeology and Interdisciplinarity’.

ABSTRACTS

1 RISING FROM THE ASHES: INVISIBLE ARCHAEOLOGICAL HISTORIES BROUGHT TO LIFE

Author(s): Sebire, Heather (English Heritage)

Presentation Format: Oral

The Society of Antiquaries of London was established as a Learned Society in 1717 and was granted a Royal Charter in 1751 with the aim of “The encouragement, advancement and furtherance of the study and knowledge of the antiquities and history of this and other countries.”

The society covers a wide range of disciplines and encourages interdisciplinarity through its library, collections and meetings. The collections of the Society include over 45,000 artefacts comprising archaeology, numismatics, heraldry, material culture, fine and decorative arts and objects that illustrate the history of the society itself. The collections are therefore an invaluable source for the study of the history of the Society of Antiquaries and the role it played in the development of many disciplines including archaeology.

In the nineteenth century the Society was involved in early recording of archaeological sites including megalithic structures throughout Britain and elsewhere and commissioned surveys and accounts of these sites for publication. Money was raised to publish the work through public subscription. However as they were about to go to press there was a catastrophic fire at the printers and many of the drawings were destroyed. The project lost momentum and was never brought to fruition. The Society was not prepared at the time to finance further work. Many of the originals of the drawings do survive in various institutions but still remain invisible to the archaeological record as they have never been published. This paper will address the issue of material in archaeological collections such as these nineteenth century surveys that have archaeological as well as intrinsic value but have never been in the public domain. Some of these drawings relate to major sites in British archaeology such as Stonehenge and Avebury and are therefore very important in the archaeological record.

2 TEXTUAL TRACES OF LOST OBJECTS. THE COLLECTION OF THE ACADEMY OF TURKU AS THE FIRST ARCHAEOLOGICAL COLLECTION IN FINLAND

Author(s): Kunnas, Liisa (University of Helsinki)

Presentation Format: Oral

When a devastating fire burnt the city of Turku in 1827, it also destroyed most of the collections kept in the Academy of Turku. The Academy, founded in 1640, was the first university in Finland and the predecessor of the modern-day University of Helsinki. Beginning with art and numismatic collection, the collections expanded through donations during the late 18th - early 19th century to include archaeological, historical and ethnographic objects and natural specimens. After the fire, the university was moved to Helsinki and the collection was started over, later becoming one of the foundations for the collections of the National Museum of Finland. The story of the lost collection of the Academy is closely intertwined with the early history of archaeology in Finland, including also intriguing aspects of natural disaster and political entanglement.

The only material remains of the original Academy collections having survived the fire and still existing today are the coins and medals kept in the National Museum, some of them partly melted and soot-covered. They are mostly without context and uncatalogued. What then can be said about archaeological objects that maybe once were included in the collection? This paper examines the possibilities of reconstructing a disappeared collection through textual sources, the traces of vanished, invisible objects existing in texts like puzzle pieces.

3 THE ‘WOUNDED LIONESS’ IN SPAIN: AVATARS OF THE DISSEMINATION OF THE ARCHAEOLOGY OF ANCIENT MESOPOTAMIA IN SPANISH COLLECTIONS AND MUSEUMS

Author(s): Garcia-Ventura, Agnes (IPOA - Universidad de Barcelona)

Presentation Format: Oral

The first millennium BC relief found at Assurbanipal’s palace in Nineveh and known as the “wounded lioness” (or “dying lioness”) has been on display at the British Museum since the end of the nineteenth century, and was selected by the museum to be among the pieces to be copied in plaster casts. These replicas were afterwards sold to universities and art schools and also to cast museums, which were becoming immensely popular at that time.

Several collections in Spain acquired casts of the “wounded lioness”. The relief brought Spanish audiences into contact with the archaeology of the ancient Near East, and in fact in some collections it was the only example of its kind.

In this communication I explore, first, why it was precisely the copy of this relief, rather than any other, that circulated so widely among Spanish collections. Second, I aim to establish who was commissioned to make some of these copies, and why. At present it seems they were mostly commissioned to the British Museum, even though the workshop of the Real Academia de Bellas

Artes de San Fernando in Madrid produced plaster casts and still today offers the “wounded lioness” in its catalogue. One might wonder about the reasons for this choice. What was the main issue: the quality of the casts, diplomatic relations between Spain and the United Kingdom, or both? In this communication I will consider these and other questions in order to assess, on the one hand, the extent of international networking and, on the other, the role of cast collections in transferring knowledge of the archaeology of the ancient Near East in Spain at the turn of the twentieth century.

4 CROSS COUNTRY COLLECTIONS: MAKING VISIBLE THE LOST RESULTS OF SIR AUREL STEIN'S ARCHAEOLOGICAL WORK

Author(s): Jeney, Rita (Bhaktivedanta College)

Presentation Format: Oral

Although the research area of Sir Aurel Stein fell outside of Europe, two European countries consider this great explorer of the 20th century their own: the country he was born in, Hungary, and the country he served as an archaeological superintendent, Great Britain. Consequently, these two countries have archives containing much material relating to Stein's archaeological explorations (the Library and Information Centre of the Hungarian Academy of Sciences and the Bodleian Libraries University of Oxford). The scattered nature of the material makes it challenging for the researcher to draw a complete picture, which emerges only after the cross-collection comparison and analysis has been executed. Stein's unpublished exploration of the lost Sarasvati River in British India gives a good example how the parallel examination of archival photographs in Hungary, letters and diary notes in England and stored artefacts in India can allow us to make visible the lost archaeological results from the last century and explore Stein's identity in Colonial India.

5 NATION, NATIONALISM AND ARCHAEOLOGICAL MUSEUM COLLECTIONS IN INTERWAR ROMANIA (1918-1939)

Author(s): Coltofean-Arizancu, Laura (University of Barcelona)

Presentation Format: Oral

The First World War and the Union of 1918 are two events that completely reshaped the Kingdom of Romania at the beginning of the 20th century. The territory and population of the Romanian Kingdom doubled, as a result of the unification with the provinces of Bessarabia, Bukovina and Transylvania. Romanians then found themselves in the process of defining their own identity within the newly formed Greater Romania. In the years that followed, Romanian authorities aimed at maintaining the recently gained territories and defending them against Hungarian and Russian revisionism. They also wished to integrate the large number of ethnic minorities and finish the legislative, administrative and economic unification of the provinces. Solidarity and unity were seen as key factors in achieving these goals which created a fertile ground for the flourishing of a nationalist discourse that emphasized Romanian individuality. This discourse also impacted the archaeological research and museum practices of the time. Which were the scientific narratives built around museums and their collections? Which were the agendas behind collecting, researching and exhibiting archaeological objects and collections in Romania between the Two World Wars? This paper explores the role of archaeological museums and collections in the construction of the Romanian nation and identity in interwar Romania, from 1918 to 1939.

6 INVISIBLE NARRATIVES: J. M. BAIRRÃO OLEIRO, 'MUSEU MONOGRÁFICO DE CONIMBRIGA' AND SCIENTIFIC STRATEGIES DURING THE 60S

Author(s): Martins, Ana Cristina (IHC-NOVA FCSH / UÉvora / FCT; Uinuarq-ULisboa; InterArq Project, Universitat de Barcelona)

Presentation Format: Oral

Established in 1962, the 'Museu Monográfico de Conimbriga' ('Conimbriga Monographic Museum') exhibits exclusively artefacts from the roman site of Conimbriga intermittently excavated since the end of the 19th century. His first director was João M. Bairrão Oleiro (1923-2000), professor at the University of Conimbriga, after getting a specialization abroad on roman art and archaeology. Committed to improve roman archaeology in the country, Bairrão Oleiro succeeded in transforming Conimbriga into a field school for students aiming to become archaeologists. Moreover, he was able to interconnect classes, fieldwork, museum studies and editing work whilst opened the way to institutional and international collaboration.

Aware of the role played by this site in the academic career of Bairrão Oleiro, and of Bairrão Oleiro in the safeguarding of this site, we aim now to understand, based on new archive material, how he used the site - specially the Museum collections -, as a way to: 1. identify the University of Coimbra as a national epicenter of roman archaeological studies; 2. stimulate national and international collaboration; 3. integrate scientific networks; 4. build scientific narratives; 5. promote heritage politics; 6. develop archaeology in the country, encouraging interdisciplinary approaches.

7 CARLO DE MARCHESETTI AND THE CIVIC MUSEUM OF ANTIQUITY OF TRIESTE (NORTHEAST ITALY): A ONE-HUNDRED-YEAR-LONG RELATIONSHIP

Author(s): Montagnari Kokelj, Manuela - Moser, Susanna (University of Trieste) - Vidulli, Marzia (Civico Museo di Antichità J.J. Winckelmann, Comune di Trieste)

Presentation Format: Oral

Carlo de Marchesetti is widely recognized as the most important scholar of the beginnings of Palaethnology, in the late 1800's

and the early 1900's, in the Caput Adriae, i.e. the regions bordering on the northern Adriatic Sea, part of the Austrian-Hungarian Empire until WW1. His cultural background – a degree in medicine and a European reputation as botanist –, gave him a multidisciplinary approach to field research and study. His position as director of the Museum of Natural History in Trieste for over 40 years allowed him to establish institutional and personal relationships with museums, research centres and scholars in Europe and beyond: among his contacts, L. Pigorini, O. Montelius, R. Virchow, H. Schliemann and R.F. Burton, to name a few. Moreover, the findings from his field activities were stored, and are still largely preserved in his own Museum and, after his death, in the Civic Museum of Antiquity (artefacts); notes, documents, unpublished materials are also kept in the Civic Library. Materials and documents are fundamental to re-examine the pre-protolithic findings in caves, castellers (hillforts) and necropolises, since Marchesetti published many articles and two books – *I castellers preistorici di Trieste e della regione Giulia; Scavi nella necropoli di S. Lucia presso Tolmino 1885-1892* – to present the results of his excavations, but not all findings were included. Moreover, later advance in scientific theory and methods allow opening new lines of research, such as the recent bio-archaeological one on the Iron Age necropolis of S. Lucia near Tolmino/Most Na Soči (now Slovenia), where Marchesetti found 3960 cremation burials. Studies on the social structure, gender differentiation, metallurgical characteristics of bronze objects and typology of all materials found in this cemetery were carried out in the 1980's and 1990's, and at present a complete re-examination of the necropolis is in progress.

8 SILENT COLLECTORS, NOISY COLLECTIONS. TRACING THE PROVENANCE OF ARTIFACTS FROM THE SEVEREANU ARCHAEOLOGICAL COLLECTION (EARLY 20TH CENTURY, BUCHAREST)

Author(s): Opris, Vasile - Majuru, Adrian - Pirvulescu, Dan (Bucharest Municipality Museum) - Mirea, Dragos - Simion, Corina (Horia Hulubei National Institute for Physics and Nuclear Engineering)

Presentation Format: Oral

This paper aims to trace the provenance of several artefacts and groups of artefacts from Maria and Dr. Severeanu archaeological collection, an impressive variety of objects that comprises over 3000 items from Palaeolithic to the Medieval Ages. The objects were gathered, studied and kept by the Severeanu family in their house in Bucharest at the beginning of the 20th century. George Severeanu was a reputed radiologist and his wife Maria was a landlord's daughter and a housewife during their marriage. Soon after George Severeanu's death in 1939, the collection was donated by Maria to the Bucharest Municipality Museum and between 1956 and 1994 the George Severeanu Museum was opened to the public in the collectors' house. Considering the collectors' testament request that the whole collection have to be published in specific catalogues, our team began to investigate the provenance of the objects selected for a first series of publications. Unfortunately, there was little evidence on how the process of collecting was carried out and just scarce information about some of the items provenance was known at that moment. We started with the study of the few archival documents and publications preserved, but on the way we had to call archaeometry for help. Chemical and physical analyses, combined in one case with C14 dating were employed. Thus, new valuable, previously unknown information was gathered. Putting all things together, we managed to detect the origin and the provenance of some of the analysed items. The revealed stories of the archaeological artefacts bring a major contribution to the understanding of how a private collection was formed at the beginning of 20th century in Bucharest and also emphasize the social relations between the collector and contemporary archaeologists.

9 AN APPROACH TO INTERDISCIPLINARY CONTRIBUTIONS TO ARCHAEOLOGY. THE ARCHAEOLOGICAL COLLECTION OF GEORGE BONSOR SAINT-MARTIN

Author(s): Díaz, Ana (City Council of Mairena del Alcor. Castle of Mairena; University of Sevilla)

Presentation Format: Oral

At the beginning of the 20th century George Bonsor bought the castle of Mairena del Alcor with the objective of creating and furnishing a museum with the artifacts, photographs and manuscripts coming from his excavations at the Region of "Los Alcores". His goal was to build an archaeological museum to convey the site-specific story of the southwest of Spain in the broader context of protohistory. The exchange of information and artifacts with national and international amateur, museum curators and scholars specialized in various fields helped to raise his collections and the character of the institution and created an active and strong network that contributed to the implementation of the latest practices in archaeological research, displays and museum management. With the aim of publicising the museum and positioning it on tourism routes in province, he conceived a comprehensive communication and promotion strategy that led the monument being marketed by major national and international agencies. Its collections and the own monument were included in the official programme of the Ibero-American Exhibition of Seville in 1929 and national and international tourists, scholars and scientist like the Marquis of Cerralbo Enrique de Aguilera y Gamboa, Pierre Paris, Raymond Lantier or Manuel Gómez Moreno visited the castle attracted by its collections. This paper aims to explore and analyze the impact of the project.

10 GENDER IDENTITY AND INTERDISCIPLINARITY

Author(s): Díaz-Andreu, Margarita (ICREA & Universitat de Barcelona)

Presentation Format: Oral

In this paper the history of women in the development of archaeology will be analysed through the prism of interdisciplinarity. An examination will be made on whether interdisciplinarity became an alternative form of access to the discipline and the study

of collections, if so, whether this happened in all the different disciplines with which archaeology collaborated. A distinction will be made on the different major periods in the history of archaeology. Attention will also be paid on whether geography and nationality may have been an important factor in the particular ways women engaged in interdisciplinarity. Finally, there will be an assessment on the particular context in which interdisciplinarity in the study of collections took place. After providing a general context the paper will focus on women who were born in the first decades of the twentieth century. Women who will be mentioned in the paper include the palynologists Arlette Leroi-Gourhan (1913 - 2005), Josefina Menéndez Amor (1926 - 1985) and the paleobotanist Maria Hopf (1913 - 2008).

11 A HISTORY OF BRAZILIAN ARCHAEOLOGY FROM A SAMBAQUI (SHELL MOUND) RESEARCH PERSPECTIVE

Author(s): Afonso, Marisa (Museu de Arqueologia e Etnologia, Universidade de São Paulo)

Presentation Format: Oral

The shell mounds (sambaquis) located along Brazilian coast have drawn attention since the sixteenth century, due to their dimensions, visibility and artefacts, but scientific research only began in the middle of the twentieth century. At the coast of São Paulo State (Southeastern Brazil) the first excavations, with scientific approach and interdisciplinary teams, started in the 1950s under the leadership of Paulo Duarte and a great collaboration with French archaeologists Paul Rivet, Director of the Musée de l'Homme (Paris, France), Joseph Empereire and Annette Laming-Empereire. The first archaeological excavations, carried out at Maratuá shell mound, contributed to the understanding of the shell mounds with modern methodological approaches, and to the formation of Brazilian archaeologists. A long-term project, held by the Museum of Archaeology and Ethnology, University of São Paulo (São Paulo, Brazil), a public institution, investigates the archaeological collections stored in the museum, and associated records from different shell mounds excavated from the 1950s to 2010s. In addition to the artefacts and samples, the archaeological archive includes paper documents (notebooks, drawings, site maps, site records, project reports, publications, correspondence) and photographic records (colour slides, colour prints, black and white prints, negatives). Special attention is given to the organization, digitalization and safeguard of documents and photographic collections. At the same time, collections-based research is being conducted on lithic and shell artefacts, integrating past and current projects. This paper intends to review and discuss the history and development of the archaeological research undertaken in shell mounds at São Paulo State coast, its important contribution to the understanding of the archaeological record and sambaqui societies, and its influence on the history and trajectory of Brazilian archaeology.

12 THE ARCHIVE IN ARCHAEOLOGY: AUTOPOIESIS, LAW, AND INDIGENITY

Author(s): Soderland, Hilary (Attorney at Law)

Presentation Format: Oral

This paper posits the legislative archive as archaeological artifact to demonstrate how the law-making process creates a legislative archive for archaeology and, in turn, how the terms and provisions of the law not only rely upon pre-existing archives but also actuate and perpetuate the creation of new archival data. In so doing, this paper makes visible the process by which law's relationship with archives is autopoietic. It also illuminates how the legislative archive is an official written repository that captures colonial narratives, modalities of identity and collective memory, as well as dynamics of power. Archives of court records, testimonies, administrative processes, legislative histories, and the text of law itself are fundamental to how law regulates the archaeological record and positions the rights of indigenous peoples in the United States. Archives factor into claims of repatriation, requirements of standing, disposition decisions, judicial rulings, administrative decision-making, and more – reaching far beyond the archive created by excavation alone.

Emphasis on the 1990 Native American Graves Protection and Repatriation Act (NAGPRA) and implementing regulations indicates the ways in which archives are now essential to how law implements, effectuates, enforces, and arguably legitimates the law governing archaeology – authenticating or invalidating cultural heritage claims. Examining NAGPRA also uncovers how archaeology's archives are infused with cultural alterities. Indigenous peoples' rights under the law are inextricably linked to the ways in which legislation relies upon and/or fashions archives. Moreover, archives – and law – often eclipse constructs of intangible heritage. This paper highlights the autopoietic system whereby law creates archives, and archives reinforce law, to underscore how knowledge production and access to the archaeological past is determined in a way that often eschews, rather than embraces, cultural diversity and the intangibility of heritage.

13 DIGITIZING THE BRONZE AGE (AT THE NATIONAL MUSEUM OF DENMARK)

Author(s): Walsh, Matthew - Reiter, Samantha - Frei, Karin - Klingenberg, Susanne (The National Museum of Denmark)

Presentation Format: Oral

The archaeological records archive at the National Museum of Denmark houses one of the most comprehensive national collections of original archaeological documents in the world. The Bronze Age archaeological reports therein date to the mid-19th century, with accession information collected and collated since 1806. In addition, the archive houses many iconic original artworks in the corpus of European Bronze Age literature. However, as they are still in paper form they are prompt to decay, and there remain some natural limitations with respect to access. Hence, the records remain in some aspects invisible to the public. We provide a brief overview of the archive and its significance to Danish and broader European cultural heritage. We present an

ongoing strategy to systematically digitize the Bronze Age archaeological records collection at the National Museum of Denmark as well as efforts to make the archive's records accessible online. We highlight the importance of these types of efforts in the contexts of the transfer and exchange of knowledge by museums, and describe how contemporary archaeological research is augmented by access to such legacy documents. Finally, we discuss these efforts as an integral responsibility of museums in the Digital Age and offer insights into implementation of the digitization undertaking thus far, with the aim to provide new insights into Nordic Bronze Age identity.

309 LOGISTICS AND NATURAL RESOURCES: UNRAVELLING THE DYNAMICS OF SUPPLY AND TRANSPORTATION OF BULK MATERIALS FOR CONSTRUCTION PURPOSES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Vanderhoeven, Timo - Kars, Eva (EARTH Integrated Archaeology) - Magnusson, Gert (Stockholm University)

Format: Regular session

Research on logistics and distribution is a tool to unravel the organization of ancient economies. Research on 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 logistics it is important to look at heavy goods such as stone and timber.

This session will discuss the logistics of heavy goods and the organization of the construction of roads, forts and public buildings. Can we unravel the strategy behind ancient 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?

ABSTRACTS

1 LOGISTICS BEHIND ROMAN BUILDING MATERIAL IN THE NETHERLANDS

Author(s): Vanderhoeven, Timo - Kars, Eva (EARTH Integrated Archaeology)

Presentation Format: Oral

Since 2000 the authors have been investigating Roman heavy goods (ceramic and stone building material) deriving from 40 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.

2 TERRACOTTA MATERIALS FROM THE OPPIDUM OF BIBRACTE (BURGUNDY, FRANCE): EXPLOITATION OF LOCAL NATURAL RESOURCES TO IMPLEMENT NEW CONSTRUCTION METHODS

Author(s): Delencre, Florent (UMR 6298 ARTEHIS) - Garcia, Jean-Pierre (Université de Bourgogne, UMR 6298 ARTEHIS)

Presentation Format: Oral

The oppidum of Bibracte, chief town of the Aedui territory, is the earliest Gallic site in the North-Eastern Gaul where Roman building materials appear. Thus, near the middle of the 1st century BC, tiles (tegulae and imbrices) and bricks are used for the coverings and the masonries, while most of the construction is characterized by perishable resources.

The analysis of these materials is founded on a consequent corpus gathering more than ten thousand fragments. Moreover, they show the mobilization of significant volumes of clay and sands to produce these building elements before their transport. The origin of the natural resources is a crucial question that can be addressed with petrographic observations (macro- and microscopic determination methods).

The use of bulk materials for construction purposes in the oppidum of Bibracte expresses the Gauls' economical needs by the exploitation of local natural resources to implement new construction methods requiring new know-how in a Romanization context. Indeed, the petrographic observations allow us to consider that all the terracotta materials are produced with sands and clays that can be found in a 5-kilometer perimeter, even if the precise tile factories are not localized. Furthermore, the petrographic description for some bricks, used as opus spicatum flooring in an Augustan domus of Bibracte, particularly differs from the common materials implemented in the oppidum and allows us to consider of imports manufactured products, in the case of precise needs

supported by the will of sponsors belonging to Aedui elites. De facto, the earliness of the Aedui in using these new integrated Roman building materials in the oppidum of Bibracte can be linked to their cultural/political/economical acquaintances with Rome.

3 OCCUPIED SPACES, EXPLOITED SPACES. THE EXAMPLE OF THE MONUMENTAL ENCLOSURE FROM LA VILLENEUVE-AU-CHATELOT, FRANCE

Author(s): Poirier, Sandy (Eveha) - Tegel, Willy (Freiburg University) - Donnart, Klet (Eveha) - Ferrier, Antoine (Conseil Général de l'Aisne) - Ravry, Delphine (Eveha)

Presentation Format: Oral

725 linear meters of a monumental neolithic palisade have been fully excavated. It is distinguished by the exceptional conservation of organic materials (450 wooden planks) and the presence of more than 1600 sandstone grinding stone fragments.

These two artifact classes document the exploitation of forest resources as well as the woodworking techniques used in the production of the palisade. Primary forest Oak trees were selected for their quality, split into large planks, which were then arranged contiguously to make the palisade. The shaping of planks is sometimes relatively elaborate, with notches of various types at their base providing insight into how they were put into place. From the degree of trunk debitage, the initial diameter of the trees can be reconstructed to obtain information on both the type of stand and the exploitation of the forests.

Indeed, traces of adze and axes have sometimes been discovered (100 on the same piece of wood). Perforations, notches, stirrups, a tenon are part of the traces of tools visible on the worked wood of the palisade.

Extensive dendrochronological dating confirms the contemporaneity of the different segments of the palisade, with its erection beginning in 3232 BC. The study of the sandstone artefacts used to block the planks provides information on the nature of the substrates exploited, but is also one of the particularities of the enclosure itself.

Among these blocks are many macro-tools, particularly millstones.

The blocks were collected from secondary deposits, after being exposed in the alluvial plain of the Seine, as confirmed by the presence of fluvial polishing and carbonate concretions prior to their use. The origin of all these anthropised blocks, remains an enigma. In any case, the discovery of these building materials draw us the outline of the exploitation and logistic strategies set up to build this Neolithic enclosure.

4 WHAT IT TAKES TO BUILD FLOOD DEFENCES, A ROAD AND A BRIDGE IN A ROMAN SMALL TOWN (STUDEN/PETINESCA, SWITZERLAND)

Author(s): Gubler, Regula - Bolliger, Matthias (Archaeological Service of Canton Bern)

Presentation Format: Oral

In the early first century AD the flood plain below the Roman small town of Studen/Petinesca (Switzerland) was the site of a large engineering project. An elaborate embankment made out of stone, gravel and timber posts straightened the river's edge, it may have served as landing for cargo boats. The bank also protected a parallel running road that ended on a timber bridge crossing the river Aare. Both roads and waterways link Studen/Petinesca well with the provincial capital (Avenches/Aventicum) and much of the province.

From 2009-2011 it was possible to excavate a 100m stretch of the embankment, the road and the remains of the bridge. The preservation of a large number of timbers in waterlogged layers together with the significant surface area examined provide several lines of investigation into questions of logistics and the supply of raw materials. A small number of inhumations associated with the construction phase of the bank may shed light on social aspects of the construction process.

This contribution intends to reflect not only on the volumes of resources consumed in this building project, but also on the construction sequence as well as the regional origins and transport of the quarry stones and mainly oak timber posts. Dendrochronology allows tight dating of the structures and ongoing research may shed light on questions of forest management in Roman Switzerland.

5 LOGISTICS MANAGEMENT OF MINES, BLAST FURNACES, FORTIFIED TOWNS AND PORTS

Author(s): Magnusson, Gert - Karlsson, Catarina (Jernkontoret)

Presentation Format: Oral

The Swedish mining area Bergslagen is situated north and west of the lake Mälaren. Stockholm, the capitol of Sweden, is located by the rapids, where the lake flows into the Baltic Sea. The introduction of industrialized mining has had a crucial bearing on our understanding of medieval Scandinavian history, the urbanization of the Mälär valley and the colonization and organization of mining areas. Circa 700 mediaeval blast furnace sites and more than 10 000 mines are identified, ancient monuments that provide possibilities to interpret the earliest industrialization and its implication on woodlands, rivers and lakes. In the Nordic sagas the mining area was called the Land of Carrying Iron ("Järnbärrland"). Ore, wood and charcoal were moved to the blast furnace sites, from which iron was transported on land, water and ice to fortified towns. The long heavy transportation required various special constructions in the landscape and a combination of transport systems on land and water. Stockholm was founded where the traders were forced to transship the iron from small boats to bigger ships.

One site in particular, Lapphyttan, contributes to a better understanding of land use and daily work at a blast furnace site. The excavations show a sophisticated industrial facility in the 13th century. Ores of different qualities were used from five to six mines

some 20 km away. Charcoal was produced within a radius of 20 km. Trading goods such as lump iron, osmund iron and iron bars, have been found. The investigations reveal an industrial establishment requiring complex logistics. Based on the archaeological material the paper discusses the tacit knowledge and technology involved to manage the logistic systems and a transport in different parts of the landscape.

310 THE IMPORTANCE OF FISHING FOR CULTURAL DEVELOPMENT IN THE EARLY AND MID HOLOCENE IN NORTHERN EUROPE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Luebke, Harald (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Koivisto, Satu (University of Helsinki - Archaeology; Archaeological Field Services, National Board of Antiquities) - Bērziņš, Valdis (Institute of Latvian History at the University of Latvia)

Format: Regular session

Cutting-edge interdisciplinary research of the last 10-15 years has clearly demonstrated that aquatic resources have constituted an essential part of the economic base of the early and mid Holocene hunter-gatherers of Northern Europe and, therefore, it may be better to refer to these groups as hunter-fisher-gatherer communities. New research has revealed archaeological sites also in submerged and wetland conditions, which has led to the discovery of well-preserved fishing equipment as well as the recovery of larger quantities of small-sized and fragmentary fish remains. In addition, isotopic research on human bones and chemical analyses of early pottery have attested to the considerable consumption of aquatic resources by early forager communities. Some novel approaches have also been developed, for example, in studying the sedimentary record of open-air sites suggesting systematic utilisation of fish even in areas where the direct evidence confirming this is scarce or missing.

The fishing topic seems to be central for the understanding of various hunter-fisher-gatherer communities, and therefore this session aims to distribute information about novel and cutting-edge scientific methodologies for furthering our knowledge about the subsistence and cultural development of early and mid Holocene populations. The purpose here is to convene specialists who work actively on fishing-related topics in Northern Europe, between the North Atlantic and the Urals. Presentations will be highly appreciated on topics concerning, e.g., the application of novel and/or interdisciplinary approaches for improving our understanding of the importance of fishing, how to proceed within fishing studies and what methodologies and cooperation (inter/multidisciplinary) ought to be established and developed further.

ABSTRACTS

1 FISH AND TOOLS OF MESOLITHIC SOCIETIES IN POLAND

Author(s): Osipowicz, Grzegorz - Makowiecki, Daniel - Orłowska, Justyna (Nicolaus Copernicus University/ Institute of Archaeology) - Zabiłska-Kunek, Mirosława (Institute of Archeology, Rzeszów University)

Presentation Format: Oral

With the beginning of the Holocene, the development of water conditions played a crucial role for Mesolithic societies. The areas of the Baltic seashore, Lakelands and net of rivers, played one of the most important factor in advance of fishing activities which started to become one of the main subsistence strategies in that time.

The Mesolithic hunters, develop many kinds of tools and methods of exploitation of the water environment and Polish lands provided many archaeological and archaeoichthyological premises supporting the assumption that fishing was very important part of their life. Bone artefacts, in a form of hooks, points or harpoon-heads, discovered in fillings of the Polish lakes, rivers, wetlands or swamps, represent a unique evidence of cultural, practical and technological development in that time. Besides mentioned artefacts, the next evidence of fishing activities are represented by ichthyofaunal remains found on some archaeological sites, like Dąbki, Dudka, Miłuki and Mszano.

The paper id presented the most important finds of Mesolithic osseous artefacts generally associated with fishing activities from Poland and discuss about their role and function in the light of performed contextual and traceological studies. Except that we will report archaeoichthyological data from the mentioned sites and also new Mesolithic assemblages recovered in Paliwodzina and Ludowice in the central Poland. These two different type of data will be used for evaluation of fishing and strategies of fish caches by Mesolithic societies.

The work was funded by the scientific project from the National Science Center (NCN) in Cracow (Poland) no. 2016/23/B/HS3/00689.

2 TRANSFORMATION OF SUBSISTENCE STRATEGIES OF INLAND MESOLITHIC HUNTER-GATHERER-FISHER GROUPS IN THE SOUTHWESTERN BALTIC REGION: AN UPDATE FROM FRIESACK, NORTHERN GERMANY

Author(s): Luebke, Harald - Groß, Daniel (Centre for Baltic and Scandinavian Archaeology; CRC 1266: Scales of Transformation) - Krause-Kyora, Ben (Institute of Clinical Molecular Biology, Christian-Albrechts-University Kiel; CRC 1266: Scales of Transformation) - Meadows, John (Centre for Baltic and Scandinavian Archaeology; Leibniz-Laboratory for Radiometric Dating and Stable Isotope Research, Christian-Albrechts-University Kiel; CRC 1266: Scales of Transformation) - Robson, Harry Kenneth (Centre for Baltic and Scandinavian Archaeology; BioArCh, University of York) - Schmölcke, Ulrich (Centre for Baltic and Scandinavian Archaeology; CRC 1266: Scales of Transformation) - Gramsch, Bernhard (Retired; Formerly Brandenburg State Office for Preservation of Monuments and State Archaeological Museum)

Presentation Format: Oral

Recent studies have shown that faunal assemblages from Mesolithic sites in inland Northern Europe contain more fish remains than previously thought, but the archaeological and archaeozoological record does not reveal the dietary importance of aquatic species to hunter-gatherer-fishers, even at a societal level. Traditional archaeological methods often provide no direct indication of variable subsistence practices within a population. For these reasons, palaeodietary studies using stable isotope analyses of human remains have become routine.

In 2018 we presented radiocarbon (¹⁴C) and stable isotope data from nine prehistoric human bones from the Early Mesolithic-Early Neolithic site of Friesack 4, and isotopic data for contemporaneous terrestrial mammals and freshwater fish. The reference data allowed individual palaeodiets to be reconstructed. Further, the application of FRUITS enabled us to estimate the proportion of aquatic derived protein relative to other resources. Moreover, radiocarbon ages from a number of freshwater fish enabled us to determine the local dietary reservoir effects. Although the number of individuals was small, it was possible to infer a decline in the dietary importance of fish from the Preboreal to the Boreal Mesolithic, and an increase in aquatic resource consumption in the Early Neolithic.

Since then, we have made further investigations on additional human remains from the Neolithic strata of Friesack 4, and others in the periphery. In addition, recently published data on other Mesolithic remains from northern Germany have become available. This has provided us with the opportunity to expand our understanding of the changing importance of aquatic and terrestrial resources, particularly the transformation of subsistence strategies in the Mesolithic and across the Neolithic transition in the southwestern Baltic area.

3 PREHISTORIC WATER TRANSPORT OF THE EAST EUROPEAN PLAIN: DUGOUTS AND/OR SOMETHING ELSE?

Author(s): Kashina, Ekaterina - Gak, Evgeniy (State Historical Museum, Department of Archaeology) - Okorokov, Aleksandr (Russian Research Institute of Cultural and Natural Heritage)

Presentation Format: Oral

During the whole mankind history the water transport took the important role in fishing. Several dozens of dugouts have been found in river sediments and peat-bogs of the East European Plain. The chronology of these boats partly could belong to the Prehistoric epoch, but it can be proved only by the C14 dating of wood. Our project (Russian Foundation of Basic Research 19-09-00301) aims to investigate all so far known European Russian dugouts by specifying their age, revealing the typology and functional features. The dugout typology can not constitute the chronological sequence base. Sometimes the most simple dugouts were dated by C14 as the latest. Moreover, it is of great interest whether some other watercraft types existed here during the Stone and Bronze Ages, e.g., skin boats or birch bark canoes, the remains of which are invisible in archaeological records. Either they could have been possibly simultaneous to dugouts or their development took place in separate regions. The watercraft functionality is also of the great importance. The use of relatively small skin/birch bark boats for individual/family fishing/hunting inside the limited area could be proposed as a main watercraft function of forest hunter-gatherer-fisher communities. The use of long dugouts for fishing at the lagoons of Eastern Baltic has parallels in Ertebölle archaeological contexts. During the later Prehistoric period, large and firm oak dugouts were probably more common and aimed to carry people and/or cargo for example along the large Don River. The petroglyphic representations at Lake Onega and the White Sea illustrates the use of large skin boats for seal and white whale hunting, though the boat remains are still unknown at the sites.

4 FISH FROM A STONE AGE GRAVE UNDER THE SHELLMIDDEN AT RIŅŅUKALNS, LATVIA

Author(s): Ritchie, Kenneth (Center for Baltic and Scandinavian Archaeology; Moesgaard Museum) - Lübke, Harald - Schmölcke, Ulrich (Center for Baltic and Scandinavian Archaeology) - Meadows, John (Center for Baltic and Scandinavian Archaeology; Leibniz Laboratory for Radiometric Dating and Stable Isotope Research, Christian-Albrechts-Universität) - Bērziņš, Valdis (Center for Baltic and Scandinavian Archaeology; Institute of Latvian History, University of Latvia) - Kalniņš, Mārcis (Center for Baltic and Scandinavian Archaeology; Faculty of History and Philosophy, University of Latvia) - Brinker, Ute (Center for Baltic and Scandinavian Archaeology) - Zagorska, Ilga (Institute of Latvian History, University of Latvia) - Richter, Kristine (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

The famous freshwater mussel shellmidden at Riņņukalns, Latvia continues to reveal life in the Stone Age of the eastern Baltic.

A long history of excavation beginning already in 1874 had revealed two Stone Age burials as well evidence for the lives of those interred and others who lived at the locality. Two additional burials were discovered during excavations in 2017 and 2018 and, intriguingly, one of them appears to have been accompanied by grave offerings of fish. We will highlight findings from the burial of a middle-aged man found in 2017 and associated grave finds. ZooMS (peptide mass fingerprinting) results from a grave feature dominated by bones of the perch family (Percidae) have helped to clarify identifications of bones from very small individuals of perch (*Perca fluviatilis*) and ruffe (*Gymnocephalus cernua*). Although analysis is ongoing, preliminary results suggest both that small fish were an important component of the overall subsistence regime during the site's occupation – and that this particular deposit is unusual because of the overwhelming predominance of very young fish and the preeminence of the perch family. Our investigations at Rinnukalns emphasize the role of fishing in life and death for these prehistoric hunter-gatherers.

5 THE UTILISATION OF SALMONID RESOURCES IN MID-HOLOCENE FINLAND

Author(s): Koivisto, Satu (University of Helsinki) - Butler, Don - Shahack-Gross, Ruth (University of Haifa, Laboratory for Sedimentary Archaeology)

Presentation Format: Oral

Based on historic sources, mass harvesting of Atlantic salmon (*Salmo salar*) and whitefish (*Coregonus lavaretus*) formed the basis of the coastal river economy in NW Finland far into the 20th century. The prehistoric origin of this nutritional source is however much less known because salmon bones are very rare at archaeological sites in northern areas. As a result, there are serious gaps in our knowledge concerning the antiquity of northern salmon fisheries and their impacts on shaping biodiversity, hunter-gatherer adaptations, and human-ecological networks. The incredibly low number of salmon remains in Finnish archaeofaunal assemblages have also been explained as reflecting not only poor preservation and coarse excavation techniques, but also processing, storage, and waste disposal which may be key factors affecting the representation of salmonid remains at archaeological sites. However, rare minerals formed in burned salmonid bones can preserve at prehistoric sites, thus informing on the early utilisation of these resources. Fine sieving and mineralogical analyses along with zooarchaeological identification of recovered bone fragments in hearth sediments from the c. 5,600-year-old Yli-Ii Kierikinkangas site on the Iijoki River have confirmed for the first time that the people living at this village did incorporate salmonids into their economies. Similar novel approaches utilising archaeological soils and sediments will thus expand our knowledge of salmonid harvesting at different times and places despite the absence of morphologically classifiable fish bones.

A. BONE AND ANTLER FISHERY EQUIPMENT OF KOLA PENINSULA: TYPOLOGY, TECHNOLOGY AND USE-WEAR ANALYSIS

Author(s): Malyutina, Anna (The Institute for the history of material culture) - Murashkin, Anton - Kiseleva, Alevtina (Saint-Petersburg State University)

Presentation Format: Poster

Complex studying of hunting and fishing equipment which include leisters, arrow, harpoon heads and fishhooks made of bone or antler from archaeological sites of Kola Peninsula dated back to 5000 cal BC – BC/AD was conducted. A classification system of barbed harpoon heads and fishhooks was developed on the basis of morphological analysis. Four periods were defined as a result of conjunction analysis: A (5000-2500 cal BC), B (2500-1500 cal BC), C (1500-900 cal BC), D (900-0 cal BC). Techniques of primary and secondary processing and manufacturing of 125 items from 5 sites have been identified on the basis of technological, experimental and use-wear studying. Blanks and preforms were made by longitudinal splitting and fracturing. For secondary processing were used cutting, planing, scraping, drilling. Abrasion and polishing were used on the final stage. Most of the artefacts were manufactured with stone tools, but traces of metal use were recognized on items from Kola Oleneostrovsky Grave field.

315 FUNERARY PRACTICES IN LATE ROMAN PERIOD AND EARLY MIDDLE AGES

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Tiplic, Ioan Marian ("Lucian Blaga" University of Sibiu) - Musteata, Sergiu ("Ion Creanga" University of Chisinau) - Popa, Alexandru (National Museum of Eastern Carpathians) - Cringaci Tiplic, Maria (Institute of Social Sciences and Humanities Sibiu)

Format: Regular session

Funerary archaeology is the field of medieval archaeology that yields the most palpable historical evidence. At the same time, it helps not only to reconstruct funeral practices, but also to rediscover essential facts about the social and economic history of different peoples.

The Late Roman Period and Early Middle Ages in the territory spreading between the Danube and the Adriatic Sea distinguish themselves through the abandonment of several sites and the increased defensive positions often erected on elevated fortified sites. This permanent, periodical, or temporary abandonment, a practice that started in the fifth century and gained momentum in the sixth century, had led to important shifts in the topography of towns and settlements, their occupation patterns, demographic make up, and their responsiveness to the rise of Christianity. Christian insignia have been identified across the Avar Khaganate, but this does not necessarily point to the fact that they coincide with their owners' religious belief. It is commonly thought that the Christian communities that emerged in urban centers during the Late Roman Period and following the fall of Moravia in the tenth century A.D were forced to relocate beyond the walls of these fortified centers, to marginal areas, which, in

turn, appears to have contributed to the spread of Christian funeral practices across rural territories.

The main scope of this session is to offer an overview of how various European scholars approach the topic, while taking into account that research in this field has produced quantitative and qualitative results that vary extensively across different European centers. It is for this particular reason that this session sets out to analyze the Late Roman and Early Middle Ages funerary practices, which may provide us with precious insight into the multiculturalism of the ethnically diverse groups that came to settle on the foundations of the former provinces of the Roman Empire from the Adriatic Sea and the Carpathians.

ABSTRACTS

1 ELITE BURIALS ON THE IBERIAN PENINSULA DURING THE LATE ANTIQUITY

Author(s): Sánchez Ramos, Isabel (University College London, Institute of Archaeology)

Presentation Format: Oral

Early Christianity in the Iberian Peninsula resulted in changes to the urban setting of graves and cemeteries. The arrival of a seasonal liturgy that embraced *loca sacra*, honouring the memory of illustrious figures of the Christian faith was agent in the transformation of late-antique and early medieval townscapes. The material versatility evidenced in the reframing and design of new funerary areas reflects Christianization, but also the status and agency of local elites. This paper argues that these processes were influential in changing the urban landscape in Spain and Portugal, introducing new monumentalized and sacred spaces, but that these changes were also felt in rural areas too. This presentation will focus on the structural form of the graves and tombs that we can associate with the Christianised and ecclesiastical secular elites of the era, and their location in the developing funerary topography. By evaluating new archaeological evidence, new thoughts can be offered on the development in Spain of the late antique urban and rural landscape.

2 LATE ANTIQUE FUNERARY ARCHAEOLOGY IN RURAL CONTEXTS: THE VIEW FROM THE NORTH-WESTERN PROVINCES

Author(s): Dodd, James (VU Amsterdam)

Presentation Format: Oral

From the middle of the 3rd century onwards a palatable shift is visible in the inhumation of burials related to villa settlements in the North-Western provinces. Burials and graves become more haphazard at villa settlements, shifting into occupied buildings or formerly residential or productive abandoned zones. This is characterised by a decreasing trend in burial goods and a generally E-W orientation by the beginning of the 5th century. This radical challenge to the Late Antique division between life and death is part of a larger transformation of the rural landscape and is mirrored at urban sites in the 4th and 5th centuries. This new pattern demonstrates that large-scale social change was being undergone by elite rural populations and reflected the changing patterns and priorities of rural populations in the North-Western provinces during Late Antiquity.

This paper will introduce a dataset of villa sites in Germania, Belgica and Britannia displaying these new forms of funerary expression and explore the reasoning behind this, arguing that new socio-economic conditions, characterised by a new style of occupation and influenced by other factors, including the beginnings of rural Christianity affected the burial processes of villa estates and marked the end of the Classical taboos between life and death.

3 EASTERN TRANSYLVANIA DURING THE LATE ROMAN PERIOD: IDENTITIES, INTERACTION AND INTEGRATION INTERPRETED THROUGH THE FUNERARY DISCOVERIES

Author(s): Popa, Alexandru (National Museum of Eastern Carpathians, Sf. Gheorghe)

Presentation Format: Oral

My presentation focuses on the Late Roman graves from the eastern part of Transylvania. I want to analyse the changes in the funerary practices after the Roman abandon of the Province Dacia until the disappearance of the Sântana de Mureş-Černjachov culture (SMCC). Even from the beginning, we must underline that the Late Roman Period in the eastern part of Transylvania represents only the beginning of a historic period. Thus, the concept of archaeological cultures, with all its methodological gaps, remains the basic instrument for contemplating the distribution in time and space of the archaeological artefacts and complexes.

The results of the archaeological excavations conducted in the past 10-15 years and those of the field prospections lately conducted in the eastern part of Transylvania still question the issue of cultural individuality of this region. From a spatial point of view the research area represents - according to Brather's definition - an „identity micro-region” (BRATHER 2014, 25-27). Such well delimited geographic spaces are also known as “key regions” (“Schlüsselgebiet”) (ZIMMERMANN u. a. 2004, 49-50). This level of geographical and social space grouping offers us the possibility to study the structures of economic, social and settlement topography within the protohistoric human communities (MEIER 2009).

In my presentation I will insist on two major issues that the research of this epoch faces. First, I will stop my attention upon a distinct cultural group in the eastern part of Transylvania, different of other groups belonging to the SMCC (“Sf. Gheorghe Culture”). Then I will approach the so-called belated occupation (“verzögerte Landnahme”) of the territories of the former roman province Dacia by the bearers of the SMCC culture.

- 4 GRAVES OF THE CHERNYAKHOV CULTURE WITH ORIENTATION TO THE WEST – SEVERAL INTERPRETATIONS FOR A BURIAL RITE**
Author(s): Schultze, Erdmute (German Archaeological Institute) - Liubichev, Mikhail (University of Kharkiv)
Presentation Format: Oral
- From the 3-5th centuries the Chernyakhov culture spread over the northern Black Sea area, characterized by cemeteries both with cremations and inhumations. Among inhumations the graves with orientation to the North are prevailing. But differing from these in a number of burials the head of deceased has been oriented to the West. The percentage of such graves differs in the particular cemeteries and in several regions of the culture. Often in the W-E-oriented graves the number of grave goods is less or the inventory consists of a specific mixture in comparison to those of other inhumation graves. Therefore this burial custom has been subject of investigations on various occasions. The interpretations of the burial rite vary - as a specific tradition of one group within the community, as an evidence for a developed social structure or as an indication for the beginning spread of Christianity. Based on archaeological material of the last decade the paper will present the current state of research and compare the results with findings of the adjacent area in the West and Northwest.
- 5 FRAMING FUNERARY RITUALS IN FIRST-MILLENNIUM AD IRELAND**
Author(s): Gleeson, Patrick (Queen's University Belfast)
Presentation Format: Oral
- This paper explores the diversity of burial practices evident in the archaeological record of Ireland in the late Roman Iron Age to early medieval periods, and the degree to which these reflect social, cultural, ethnic or religious affiliation. This is a period in which the general progress from cremated to unfurnished E-W aligned burial has long been appreciated, with the appearance of E-W unfurnished and extended inhumation occurring in the 5th century AD rather dramatically. While recent scholarship has been reluctant to accord this development an association with conversion processes, there has similarly been very little integrated analysis of variability, non-normative behaviours, performance or ritual action in burial rites. This paper will present analysis of the shifting nature of cemeteries and burial rites within sepulchral landscapes. Examining how these changed through the period in Ireland, it explores the commemorative strategies, belief, and the meaning of same from the perspective of performance within the funerary arena.
- 6 FUNERARY PRACTICES IN THE TRANSFORMATION PERIOD BETWEEN THE LATE ROMAN AND EARLY MEDIEVAL PERIOD IN THE PERIPHERY OF NORTHERN FRANCIA**
Author(s): Annaert, Rica (Free University Brussels - FWO; Flemish Heritage Agency)
Presentation Format: Oral
- Until recently the rich material culture from the Merovingian cemeteries in Francia were not fully understood as researchers remained under the influence of prevailing paradigms. Today, instead of believing in a forced and abrupt imposed Germanic culture as a result of mass migrations in a depopulated area, new *longue durée* models are developed based on the research of some recently excavated cemeteries. This paper will demonstrate how grave depositions and a variety in funerary practices give us a good picture of the economic position and social dynamics of the early medieval rural communities in the northern peripheral regions of Francia.
- The research results do not deny a decrease in population in the northern periphery of Germania Secunda after the 3th-century crisis, but in some regions there seems to be a continuity in habitation during the 4th century AD. This habitation is often characterized by a merged population consisting of the remained Gallo-Roman inhabitants and families of 'Germanic' *laeti* and *foederati*. The numbers of 5th- and 6th-century graves point to an increase of the population in Northern Francia. Locally some new transrhenean settler families intermingled with the local – already mixed – inhabitants. In this period this rural communities clearly established a new identity, resulting in the so called Frankish culture. Later on during the 7th century AD new social changes can be noticed: the rural almost egalitarian population is shifting towards a territorial based class society. Moreover, in this northern periphery of the Merovingian kingdom, we can see that Christianization only achieved success during the late 7th and early 8th centuries.
- 7 TOGETHER IN LIFE AS WELL AS IN THE AFTERLIFE. DOUBLE GRAVES IN THE LATE-ROMAN CEMETERY OF IBIDA (SCYTHIA PROVINCE)**
Author(s): Aparaschivei, Danut (Romanian Academy - Institute of Archaeology Iasi) - Iacob, Mihaela (Ministry of Culture, Romania) - Soficaru, Andrei (Romanian Academy, Institute for Anthropological Research "Francisc I. Rainer", Bucharest) - Paraschiv, Dorel (Institute for Eco-Museum Researches "Gavrilă Simion", Tulcea)
Presentation Format: Oral
- The systematic archaeological research in the site of Ibida, located in the center of Scythia province, started in 2001. The fortification system, one of the most impressive of the Lower Danube region, encloses an area of over 27 hectares. The adjoining cemetery, located in the north and west of the fortress, has also an impressive size, amounting to about 25 hectares. This vast area includes also a number of burials from other historical periods (Neolithic - 2 graves, Early Roman - 4 graves, Middle Ages - 11 graves), however, the absolute majority is made by Roman-Byzantine graves (160 graves). Out of the 177 burials, 161 were anthropologically analyzed. Of these, 10 are funerary features with double burials, and 7 of these comprise of adults with children.

The present paper will detail the archaeological context, typology of tombs, as well as the grave goods, where such finds were identified, but we will also make some anthropological references related to sex, age and pathology. Our research has revealed so far that, in the case of adult-child double graves, newborns or infants were buried with adults (female in most cases - six of the seven cases, the mothers, most probably). We also have three adult-adult double funerals: one of women (age of 37 and 60 respectively); one of a 50-year-old woman and a 35-year-old man; and one of men (age of 40 and 45 respectively).

One should emphasize that 6 of the 10 double graves are of the simple pit type, with or without a coffin, while the remainder were tombs built with reused roof-tiles, stones or potsherds.

These archaeological features will subsequently allow the interpretation of their symbolic content, in correlation with the beliefs of the provincial Roman communities in the 4th -6th century AD.

8 TRADITIONS OF THE FUNERARY RITUALS FROM THE SUB-DANUBIAN AREA IN THE NECROPOLISES OF LONGOBARDS AND BULGARIANS ALONG ITALIAN ADRIATIC SIDE

Author(s): Rapuano, Silvana - Rotili, Marcello (Università della Campania Luigi Vanvitelli)

Presentation Format: Oral

During the 3-4 th century A.D., in the border territories of the Roman Empire inhomogeneous groups of Germanic culture were introduced, to which the defense of the empire was entrusted.

Already in the past, from the 2th century A.D. on, there had been the introduction of communities in various ways (inquilini, laeti, gentiles), with differentiated tax and military obligations. This had led to the start of integration of Germanic groups, of steppe peoples and communities coming from Middle Eastern areas through the purpose of repopulating the sparsely inhabited territories and of increasing production activities and the defense of the imperial borders.

In this cultural melting pot the story of the Longobard people and of some of Bulgari's aliquots, which in 5-6th century settled in the area south of the Danube. In this territory, acquired elements of Mediterranean culture and practices taken from the steppe populations with whom they come into contact. For example, from the Àvars was assimilated the pagan rite of the sacrifice of the horse laid with the rider. The cultural heritage acquired was so strong that it was still evident in the 7th century, when the Lombards with a small following of other ethnic groups had settled permanently in Italy since more than one century.

Numerous cemeteries with row tombs, such as those identified along the Morava and the Danube, were found in the Italian territory with grave goods including weapons and tools for daily life, influenced by both the Merovingian and Middle-Germanic culture, and the Àvar and Slavic cultures, to which, later, symbolic objects of Christianity were added, such as crosses in gold foil. The contribution will review, above all, the necropolis found along the Adriatic side, in Friuli, in the Marches and, specially, in Molise, where graves belonging to Bulgarian groups have also been found.

9 FROM CREMATION TO INHUMATION: THE (RE)CHRISTIANIZATION OF FORMER TERRITORY OF ROMAN DACIA PROVINCE (6TH TO 10TH CENTURY)

Author(s): Tiplic, Ioan Marian (Lucian Blaga University of Sibiu)

Presentation Format: Oral

For the chronological horizon from the 6th to the 10th centuries, there are only few approaches and most of them are dealing with the typological analysis. Nothing can be said about what the funeral ritual meant for the horizon of the incineration or the burial necropolis. A series of questions require different approaches to the historical cultural tradition of the Romanian archaeological school: biritualism is or not a regional form of transition from Paganism to Christianity? Is there a difference between the religious ceremony for the two rites: incineration and inhumation? Since can we definitely identify the existence of Christian funeral practices in communities in the Transylvanian Carpathian Basin or in the North Danubian territories?

The problem avoided by most researchers in the Central European area is precisely the reconstruction of funerary practices before the 9th century, based on the few written information and the multitude of funerary archaeological finds.

The analysis of 10th-century funerary practices throughout Central and Eastern Europe reveals a generalization of the Christian funeral ritual and the appearance of large cemeteries around the churches. In the eastern part of the continent, where important territories were not included within the sphere of influence of the Byzantine Empire or the Arpadian kingdom, a number of practices of pagan tradition have been maintained in the context of the penetration of Christianity. The inclusion of these territories within a Christian state (Kievan Russia, the Arpadian kingdom or the Polish kingdom) has accelerated the process of passing the population to Christianity under the impetus given by political authority. Regarding funeral rituals, archeology provides too little data to begin an attempt to reconstruct it. It is not easy to propose reconstructions of ritual manifestations, whether pagan or Christian, which accompanied the act of inhumation during the 6th-11th centuries.

10 FUNERARY PRACTICES IN THE CARPATHIAN-DANUBIAN REGION DURING THE EIGHTH AND NINTH CENTURIES

Author(s): Musteata, Sergiu (Faculty of History and Geography, „Ion Creanga” Pedagogical State University)

Presentation Format: Oral

The paper, based on archaeological records, presents a general view funerary practices in the Carpathian-Danubian region during eight and ninth centuries. Climatic, along with political and military factors, have directly influenced the cultural, economic, and

social environments of this area. Mapping the sites from the eighth–ninth centuries highlights some regions as being of a higher density than others. This is, on one hand, due to the current level of research in which some areas are better researched than others, and on the other hand, the picture also reflects the demographic situation of this period. In most cases, settlements are located in regions favourable for supporting agriculture, which highlights the sedentary lifestyle of these populations. The main source of research are 221 cemeteries attested in in the Carpathian-Danubian region, including 26 incineration cemeteries, 21 biritual and 174 - inhumation cemeteries.

The presence of a wide variety of funerary rites and rituals in the Carpathian-Danubian space does not allow us to support the idea of a uniform society in religious terms in the eighth-ninth centuries. On the contrary, I find the coexistence of populations with various spiritual and religious traditions in that period, which is directly shown by the discovery of incineration, biritual, and inhumation cemeteries. Based on currently available archaeological data, we can assert that the process of conversion to Christianity was only modestly advanced north of the Lower Danube in the eighth-ninth centuries.

Historically, the Carpathian-Danubian space was not only a transit territory for nomadic populations moving from the east to Central and South-Eastern Europe, but also an active area of cultural and ethnic interference. Thus, the ethnic and cultural attribution of archaeological discoveries in this region presents a problem to solve of variable relevance and difficulty.

11 OCCURANCE OF GRAVE PITS STONE LINING AT CHURCH GRAVEYARD IN POHANSKO-BŘECLAV. WHERE TO LOOK FOR ORIGIN OF THIS PHENOMENON?

Author(s): Prichystalová, Renáta (Department of Archaeology and Museology, FA Masaryk University)

Presentation Format: Oral

At the early medieval site Pohansko near Břeclav (CZ) was discovered a church graveyard with 152 graves. In the graves there were recorded several ways of grave pit adjustment, among them usage of the stone in the form of a complete or symbolic stone lining of the grave pit (in total twenty-seven times). The occurrence of the stone arrangements in the grave pits in our territory is recorded during the Early Middle Ages in the church cemeteries and in the burial grounds near the central settlement agglomerations of a regional or a supraregional character. This phenomenon had been appeared sometime in the second half of the 9th century, the greatest boom is monitored in the second half of the 10th century and the first half of the 11th century, and then slowly was faded away. The origin of this way of grave pit arrangement has not yet been satisfactorily resolved. The usage of the stone adjustment in the grave pits is mostly related to the ancient (classical) cultural heritage and spreading Christianity right from the area of the western and southern Europe, where the new christian religion was established at the time of existing cultural and social structures of the Roman Empire.

12 BURIAL PRACTICE AND CHRISTIANITY IN TRANSYLVANIA IN THE 10TH AND 11TH CENTURIES

Author(s): TIPLIC, Maria Emilia (Institute of Social Sciences and Humanities Sibiu, Romanian Academy)

Presentation Format: Oral

The transition phenomenon from the pagan religion to the Christian one and their chronology differ between the western and the eastern parts of Europe. Many archaeologists tried on the one hand to resolve the chronology of the conversion and on the other hand to prove the absence or presence of Christian funeral practices in Transylvania. Archaeology hasn't yet offered any arguments in favour of an overall Christian presence in Transylvania in the 9th and 10th centuries. The first half of the 11th century still marks a period of few conclusive proofs regarding a wide spread Christianity in Transylvania.

The archaeological approaches have launched a series of assumptions about religious indicators or markers of Christianisation, such as burial rite, direction of orientation, the frequency of burial with grave goods or with particular items (cross pendants, coins, ornaments, egg etc.), cemeteries, churchyard and Christian buildings. Our aim is to reopen and to refine the debate. Moreover, our research will focus on the archaeological evidences concerning the diversity of burial practice, mortuary topography, the gradual changes of the burial practice and material culture and the progress of Christianity in Transylvania in the 10th and 11th centuries.

A. A SPECIAL RITUAL: BIRITUAL BURIALS IN THE CARPATHIAN BASIN (THE 7TH – 9TH CENTURIES)

Author(s): Tomegea, George (ASTRA Museum)

Presentation Format: Poster

This presentation brings into discussion the issue of the biritual tombs discovered in the biritual necropolises of the Carpathian Basin. Two types of biritual tombs have been identified: tombs of partial cremation, where only parts of the body are cremated, and double biritual tombs, where there is a combination between placing the cremated remains of a deceased and the calcined remains of another body in the same grave.

In the first case, from what has been discovered so far, it seems that partial cremation was used regardless of sex, age or social status (if we think about the two horsemen). Furthermore, it was noticed that they did not always cremate the same part of the deceased's body. We consider that this was not the case of a burial that was rushed due to various reasons, which would have resulted in an incomplete cremation. We believe this was a special rite, applied only in some cases.

In the second case, the cremated remains of the deceased were placed in an urn, on the skeleton of the other deceased or near it. The double biritual tombs discovered so far always contained a male skeleton and the calcined bones of a female body. There

was no situation in which the two deceased had the same sex. The different sex of the deceased leads to the acceptance of the hypothesis of the woman being sacrificed at the death of the man in the case of Slavic populations. We can only assume that the marriages were mixed, taking place between Avar men and Slavic women. However, if this is true, the question arising is why there have been so few double biritual tombs discovered or why there are only some cases in which both burial rites were used inside the same tomb.

B. LATE ROMAN FUNERARY PRACTICES AT TOMIS, THE CAPITAL OF SCHYTIA MINOR

Author(s): Radu, Petcu - Petcu-Levei, Ingrid (Museum of National History and Archeology from Constanta)

Presentation Format: Poster

The study of the late roman necropolis is one of the essential sources for the historical knowledge and reconstruction of this period at Tomis. The importance of the city is very high, especially after the 4th century AD, when it becomes the capital of the newly formed province of Schytia Minor. From this date on, it will be also the most important Christian center in the area. The name of Tomis is mentioned in the ancient written sources as a bishopric center.

Over the years, archaeological research has brought to light a significant number of tombs, grouped in several areas. The necropolis is situated throughout the ancient main roads, which connected Tomis with the other important centers in the province, like Histria and Callatis. The late roman tombs are dated from the 4th century AD until the first half of the 7th century AD. After this date the city is abandoned, and the entire province is left under barbarian control.

C. SLAV, CROAT OR MAYBE BYZANTINE: THE WARRIOR FROM EARLY MEDIEVAL CEMETERY IN VAČANI (CROATIA)

Author(s): Fabijanac, Tomislav (University of Zadar)

Presentation Format: Poster

Early Medieval cemetery in Vačani near Skradin was discovered by accident in 2010. Systematic archaeological excavations started in 2011 (project leader is Željko Krnčević from Šibenik City Museum). So far, 18 graves have been discovered. Graves contain finds typical for the 8th-9th century period (e. g. ceramic vessels). Most significant are burials in two late-Antique sarcophagi. In one of them (Grave 3) two iron spurs were found. The other sarcophagus (Grave 10) contained remains of two male adults, early Carolingian sword (K-type), a pair of bronze spurs, solidus of Constantine V and glass bottle (probably of Middle Eastern origin) as well as some other minor finds. The type of burial used for grave 10 and grave finds indicate socially privileged individuals with possible military background. It might be expected that these individuals belong to earliest Slavic/Croat aristocracy, however, new analysis indicate that at least one of the individuals from the grave 10 is of eastern Mediterranean origin. That raises new questions about interactions between the perceived newcomers and autochthonous population on the eastern Adriatic coast. It is worth mentioning that the site in question is close to Roman Scardona but also to Roman and medieval site of Bribir. Of special importance is the fact that this small graveyard can offer a glimpse into emergence of early medieval "aristocracy" in the hinterland of Roman/Byzantine coastal towns.

317 CELEBRATING 25 YEARS (EAA25) OF COLLABORATION: HOW ARCHAEOLOGY AND THE EARTH SCIENCES ARE COMING TOGETHER TO SOLVE REAL-WORLD PROBLEMS

Theme: Global change and archaeology

Organisers: Burke, Ariane (Universite de Montreal) - Davis, Basil (Universite de Lausanne) - Riel-Salvatore, Julien (Universite de Montreal)

Format: Regular session

Archaeology has always been an interdisciplinary science situated at a cross-roads between the Social and Natural Sciences. In the past, collaborations between archaeologists and natural scientists have focussed on the production of valuable contextual information with which to interpret the archaeological record. Over the past twenty five years archaeological research has become increasingly inter-sectorial, however. Analytical tools drawn from the Earth Sciences (geographic information systems and machine-learning approaches, for example) have been incorporated into archaeological practise as scientists tackle questions relating to human evolution and demography at global, continental and regional scales. Lately, scientists in the Social and Earth Sciences have re-focused their energies towards helping to solve real-world issues, exploring what the archaeological record can tell us about human resilience and considering the implications in a context of global climate change. This session presents research that explores human/environment interactions in the past using methods drawn from ecological sciences and archaeological data, with a view to identifying the ecological tipping points that have affected human systems in the past in the hopes of helping us plan for the future.

ABSTRACTS

1 INVESTIGATION OF ANCIENT MICROSCOPIC HUMAN INDUCED SOIL POLLUTION: HOW PAST HUMAN ACTIVITIES IMPACTED SOIL CHEMISTRY, STILL AFFECTING OUR ENVIRONMENT

Author(s): Save, Sabrina (Amélie SARL)

Presentation Format: Oral

All human activity generates waste and pollutes the environment. The waste of the distant past is the stuff of everyday archaeological investigation: broken pieces of ceramic vessels, cut animal bones and rich organic sediments filling abandoned storage pits. In other words, the trash people produce. These anthropogenic wastes are also incorporated into the earthen floors of buildings, the natural surfaces around settlements, and the fields from which people obtained their food. Derived from this waste and its interaction with the sediments on/in which it is deposited, a wide range of chemicals penetrate, contaminate and transform, in other words pollute, those same sediments where people once lived and carried out their daily activities. While environmental pollution is a recent, central concern, increasingly affecting our present society, archaeologists did not start to consider ancient, much less microscopic, pollution until very recently. While ongoing research has begun to construct theoretical models explaining what kinds of human activity translates into a certain chemical imprint, no convincing coherent model yet exists.

In this paper, we will present our research project which uses geochemical surveying of extensive areas to acquire a more global view of palaeo-pollution and the human impact on soil chemistry at the landscape level. Our aim is to trace past polluting human activities in four dimensions - across landscapes and over time. The study of ancient societies can serve as pertinent lessons to understand the present world and anticipate the potential consequences of human actions. By modelling how ancient pollutants materialise and evolve in soils after centuries of taphonomic processes, archaeology can contribute to contemporary society, helping us assess the long-term impact of our own pollution and design sustainable policies to prevent present human actions from unbalancing the cycle of life.

2 REFUGIA OF FUTURES PAST: USING THE DEEP PAST TO SCOPE HUMAN-ENVIRONMENTAL FUTURES AND THE IMPLICATIONS FOR ADAPTATION

Author(s): Lyon, Christopher - Alexander M Dunhill, Bethany Allen (University of Leeds) - Tom Webb, Andrew P Beckerman (University of Sheffield) - Julien Riel-Salvatore, Ariane Burke (Université de Montréal) - Lindsay Stringer, Daniel J Hill (University of Leeds) - Paul O'Higgins, Robert Marchant (University of York) - Saupe, Erin (University of Oxford)

Presentation Format: Oral

The multi-disciplinary Refugia of Futures Past project draws on archaeological and palaeontological evidence to explore the human presence on Earth beyond 2100. We describe the initial outcomes here. Current research strongly suggests that anthropogenic environmental changes are pushing the Earth's climate and ecosystems into regimes that more closely resemble extremes of the deep past than any period relevant to modern humans. The deeper past includes periods of extreme heating, cooling, mass extinction and large-scale species range shifts. For hominin populations, less extreme climate change such as during periods of glaciation, led to retreats to refugia. However, despite the copious palaeontological and archaeological research exploring hominin and other organisms' responses to these past ecological changes, the scope of the human occupation on future Earth is very poorly addressed. Current efforts exploring human adaptation to environmental changes typically explore near futures to the somewhat arbitrary date of 2100 and thus fail to account for inevitable ecological changes continuing beyond this point. Combining current climate modelling with archaeological and palaeontological knowledge allows us to scope future ecological conditions and baselines beyond 2100. We show how providing this more scientifically grounded description of future changes and timelines can help us reframe the present scientific and public discourse on adaptation, such as those informing the IPCC Assessment Reports and adaptation strategies.

3 POPULATION DYNAMICS IN EUROPEAN PREHISTORY - DEMOGRAPHY AND HUMAN RESILIENCE

Author(s): Schmidt, Isabell - Scharl, Silvine - Zimmermann, Andreas (University of Cologne)

Presentation Format: Oral

Interdisciplinary research on human-environment interaction has been the focus of the Collaborative Research Centre 806 "Our Way to Europe", University of Cologne, funded by the German Research Foundation since 2009. Within this framework, Project E1 ("Population dynamics") established a protocol to calculate site-density based population estimates for Upper and Late Paleolithic hunter-gatherer societies. The outputs are high resolution maps of population size, density and distribution in Europe for a succession of nine Paleolithic periods. These data are temporally extended into the Holocene by estimates for central European Mesolithic and Neolithic populations (Project D4 and LUCIFS, University of Cologne).

Population dynamics in Europe during the last 40,000 years, as observed by this approach, are presented and discussed. While interdisciplinary work on palaeoenvironmental modeling, age models, and spatial analysis allows for testing of hypothesis on human-environment interaction, we also discuss results in terms of socio-cultural dynamics. Modelling long term population dynamics is accomplished by interpolating between our estimates with Logistic Equation. Our long-durée perspective on population dynamics in prehistory confirms Child's scenario of "revolutions" with stepwise increases in human population between epochs, as well as oscillating/cyclic changes occurring during such epochs. We understand these big transformations of human

history as the result of feedback loops driven by economic and social changes of societies, which affected patterns of fertility and/or mortality. On the contrary, oscillating/cyclic changes occurring during epochs of human history correlate frequently – but not always – with climatic/environmental changes affecting humans' habitat range and economic basis. Other factors such as mobility and interconnectedness, and a cultural carrying capacity should also be taken into consideration. The Adaptive Cycle Model provides a framework to approach the driving mechanisms of demographic developments in interdisciplinary investigations.

4 WEATHERING THE STORM: IDENTIFYING KEY DISRUPTORS OF HUMAN SYSTEMS

Author(s): Burke, Ariane (Universite de Montreal) - Kageyama, Masa (LSCE - CEA) - Riel-Salvatore, Julien (Universite de Montreal) - Davis, Basil (Universite de Lausanne) - HDRG, members (Universite de Montreal; LSCE - CEA; UQAM; University of Lausanne; Colorado Univesrity, Colorado Springs)

Presentation Format: Oral

Homo sapiens is a widely distributed species able to adapt to a range of climates and environments. Nevertheless, the archaeological record indicates that climate change has caused large-scale reorganisations of human socio-ecological systems in the past. Climate change is a complex process that operates at different spatial and temporal scales. Understanding the nature of climate change at specific points in time is thus crucial to understanding the nature of human/environment interactions and the mechanisms of past human resilience. Modelling climate change in the past serves a dual purpose, allowing climatologists to refine their modelling techniques while providing environmental context for the application of spatially explicit archaeological models of past human adaptations. Identifying the key variables that are critical disruptors of human systems has been the goal of the Hominin Dispersals Research Group (HDRG), an international collaborative network of archaeologists and climatologists since 2009. This paper presents an overview of the main results of this close collaboration over the past decade and discusses how they have allowed the HDRG to address the subject of climate change in the past and how we hope to apply this knowledge in the future.

5 HOLOCENE CLIMATE CHANGES AND HUMAN ADAPTATION AT TAKARKORI ROCK SHELTER (SW LIBYA): AN ARCHAEOENTOMOLOGICAL PERSPECTIVE

Author(s): Pradelli, Jennifer (School of Applied Sciences, University of Huddersfield) - Mercuri, Anna (Laboratorio di Palinologia e Paleobotanica, Università di Modena e Reggio Emilia) - Vanin, Stefano (School of Applied Sciences, University of Huddersfield) - di Lernia, Savino (Dipartimento di Scienze dell'Antichità, Sapienza Università di Roma; GAES, University of Witwatersrand, Johannesburg)

Presentation Format: Oral

The transition from hunting-gathering to food production shows distinct and different pathways worldwide. Evidence from the Central Sahara suggests original trajectories to the onset of early herding, largely related to fluctuating climate and environmental conditions.

Thanks to the outstanding well preserved stratigraphy which covers the majority of cultural sequences from Late Acacus hunter-gatherers to Late Pastoral Neolithic herders (ca. 10,200 – 4300 cal yr BP), Takarkori archaeological site, located in southwest Libya, is an enormous pool of early to middle Holocene information.

The analysis of the entomo-fauna excavated from it allowed to reconstruct the Holocene paleoclimate confirming the progressive desertification. Moreover, using an interdisciplinary approach, insects with the support of archaeobotanical analyses enable to track changes in humans' behaviour arisen to adapt to a drier environment.

During the early phases of the Holocene (Late Acacus phases), insects strictly related to humans, from species-specific parasite to synanthropic species or species associated with human by-products confirmed the re-colonisation of the area by hunters and gatherers. This flourishing period is probably associated with an amelioration of the climate ascertainable also by the presence of insects typical of Savannah grassland.

After these early more humid phases, the increasing of arid conditions from around 5900 years ago forced the populations to adapt and to exploit the less numerous resources. In fact, the changes in the entomo-faunal composition suggest the increase of animal husbandry confirmed by the remarkable rock-arts of Fezzan region depicting cattle, sheep, and goats confirming the theory of widespread pastoralism of the area.

The work presented identifies Archaeoentomology as a powerful and effective tool to be used in archaeological context for the interpretation of the past.

6 GEOARCHAEOLOGY OF HOLOCENE SOCIONATURAL DISASTERS IN THE HYPERARID COAST OF THE ATACAMA DESERT

Author(s): Salazar, Diego (Proyecto Fondecyt 11151203; Departamento de Antropología, Universidad de Chile) - Vargas, Gabriel (Departamento de Geología, Universidad de Chile; Proyecto Fondecyt 1161547) - Guendón, Jean Louis (CNRS - Retired) - Leon, Tomas (Departamento de Geología, Universidad de Chile) - Andrade, Pedro (Departamento de Antropología, Universidad de Concepción) - Goff, James (University of New South Wales) - Meza, Camila (Departamento de Geología, Universidad de Chile)

Presentation Format: Oral

Natural hazards are among the most catastrophic events to affect human societies, especially those inhabiting coastlines. Chile is a country especially exposed to potential socionatural hazards in coastal areas given its more than 4,200 km coast in the Pacific Ocean, as clearly shown by diverse recent and historically recorded events in northern Chile, such as the 1868 and 1877 mega-earthquakes and tsunamis or the episodic flooding events throughout the 20th Century, usually associated with ENSO anomalies.

The recurrent occurrence and diversity of these events challenge our capabilities as a society to manage these disasters and call for interdisciplinary research aimed at understanding the diversity of coastal socionatural disasters in Chile to foster coastal resilience. In order to do this, natural hazards have to be recorded over ample temporal scales and their effects and consequences over human population and cultural change need to be addressed.

Here, we will present results from two complementary research projects aimed at understanding the occurrence and impact of socionatural disasters throughout the Holocene in the Hyperarid coast of the Atacama Desert. We have focused our research in the identification of megaequakes and tsunamis, as well as extreme flooding events.

Both projects combine methodologies and approaches from the earth sciences, archaeology, history and ethnography, including the study of geomorphological records, morphosedimentary assemblages, multiproxy sedimentary and detailed stratigraphic studies. From a geoarchaeological perspective, the projects have analyzed the sedimentary sequences of shell middens and archaeological sites, identifying evidence of deposits and/or erosional surfaces associated with catastrophic events. Identification of catastrophic events have been correlated through stratigraphic and chronological methods to sociosultural transformations and historical trajectories.

Our results have significant implications for the understanding of cultural changes/adaptation in relation to extreme natural disasters and hazard assessment in the present.

7 ON THE PALEO-CLIMATIC/ENVIRONMENTAL IMPACTS AND SOCIO-CULTURAL SYSTEM RESILIENCE ALONG THE HISTORICAL SILK ROAD

Author(s): Yang, Liang (Christian-Albrecht-Universität Kiel)

Presentation Format: Oral

There is increasing discussion that climate and environmental factors might have also played a significant role in fostering economic and socio-cultural changes along the Silk Road as well as in a broader area. However, it is also argued that many analyses over-emphasized the deterministic mechanisms. Societal responses to external forces are nonlinear in nature. Any hypothesized direct linkages between cultural transition and environmental forcing must be treated with caution. Purely environmental explanations of societal collapse, including climatic explanations, remain less than convincing and are still controversially discussed to make a general conclusion.

This study covers the major contents and results of the newly published book "Socio-Environmental Dynamics along the Historical Silk Road". It introduces the issue of the links and processes behind climate change, environmental change, and socio-culture change in a historical perspective in the ancient Silk Road region. Analyses of the changes and development of the socio-environment system in this significant area enhance our understanding on the regular patterns of coupled natural and social evolution, and is thus of important theoretical and practical significance. We argue that the cross-cutting theme has been to reach beyond simple explanations of environmental or human determinism, but social resilience under environmental impacts. Studies indicate both that climate conditions significantly influence human socio-cultural systems and that the social-culture systems are certainly resilient to climate impacts, which is indeed the case at the historical Silk Road areas. We aim to highlight the complexity of the relationships between climatic and socio-cultural changes, and therefore encourage further investigations, for instance, of the concept of climate resilience that links both the climate impact and social response into one framework.

8 DIVERSE APPROACHES TO INTEGRATING ARCHAEOLOGICAL AND CLIMATE DATA

Author(s): Seetah, Krish - Dunbar, Robert (Stanford University) - Fleitmann, Dominik (University of Basel)

Presentation Format: Oral

As archaeology seeks to tackle larger issues facing the world, most significantly the impacts of a warming climate, connections across disciplinary boundaries are becoming increasingly necessary. Dialogue between climate scientist, anthropologists and archaeologists are facilitated not only through shared research questions and objectives, but also methodological overlap.

In particular, fruitful connections exist for understanding the impacts of recent local landcover change, demographic transformations, and technological advances that accompanied European colonialism. But how can knowledge about these events, fos-

tered from within distinct disciplines, be rationalized in order to be able to develop mitigation strategies and build resilience?

Based on two case studies derived from research on Mauritius and that combine climate data and archaeo-historic evidence, this presentation focuses on the ways that interdisciplinarity between social and earth sciences can potentially contribute to policy. This support for policy development is based either on model building, or direct integration of 'heritage' into new management strategies by local government. Overall, the aim of the presentation is to demonstrate that a united effort that combines experts and expertise has considerable potential for supporting resilience within a variety of settings.

318 BENDING THE ARC OF HISTORY TO A LOW CARBON FUTURE

Theme: Global change and archaeology

Organisers: Rockman, Marcy (ICOMOS) - Davies, Mairi (Historic Environment Scotland) - Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux) - Riede, Felix (University of Aarhus)

Format: Session with presentation of 6 slides in 6 minutes

The UN Climate Change Conference in Paris in 2015 led to the historic Paris Agreement to limit global average temperature rise to 2C and pursue efforts to keep it to 1.5C. According to the special report of the Intergovernmental Panel on Climate Change (IPCC) on limiting warming to 1.5C, released in October 2018, the world has no time to lose in reducing greenhouse gas emissions. Further, while warming can still be limited to 1.5C, doing so will require unprecedented transitions in all aspects of society.

The archaeological community has long appreciated the relationship between human activity and long term environmental change. Archaeologists are already responding to the severe threats to global cultural heritage posed by climate change and are often highly engaged in wider debates concerning impacts and adaptation. We have gathered data and stories of how past societies have responded to past climatic change and gained deep understandings of the origins of the modern socio-economic systems that have delivered modern anthropogenic climate change. But archaeology itself is suffering from a case of cognitive dissonance, as the field continues to expand practices such as carbon-intensive conferences and remote fieldwork (Reynolds 2018).

Transformational change is necessary within archaeology as part of the transition to a low-carbon economy. By rising to this challenge, we have an opportunity to provide leadership and act as an exemplar to the global community. This session will tackle the question of: how can the knowledge and practice of archaeology be used and transformed to effect rapid and ambitious decarbonization, within our discipline and beyond? Creative approaches and analyses will be welcome. And to make the session as low-carbon as possible, multiple avenues for remote presentation and participation will be explored (Skype, video, etc.).

ABSTRACTS

1 ARCHAEOLOGY IN A MATERIAL WORLD

Author(s): Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Oral

Much of the work we carry out as archaeologists is done in accordance with highly principled aims of furthering human understanding and protecting cultural heritage. Although I do not doubt the importance of archaeology or the general benevolence of archaeologists, the material foundations of our discipline - and archaeology's effects on the material world - are perhaps more complex than we often like to consider. In particular, archaeology is highly integrated into a fossil-fuel dependent economy which it depends on and sometimes supports.

There are many aspects to this integration. Some examples include:

- the reliance of the commercial archaeology sector on fossil fuel-intensive activity, including road schemes, construction and airport expansion;
- the often controversial dependence of many museums on direct financial support from fossil fuel corporations;
- more generally, the existence of a publicly funded research sector that relies on the financial surplus of carbon-intensive economies.

The task of decarbonising archaeology is not just a matter of changing the way that we travel, eat and commute. It is far bigger than that, and requires us to ask significant questions regarding archaeology's dependence on the fossil-fuel economy. As a discipline that is highly engaged with the study of material economy, we are unusually well-equipped to answer these questions. Turning an archaeological eye to our own discipline and understanding its relationship to extractive and environmentally destructive economic processes may be uncomfortable, but an honest reckoning could open new routes to understanding and acting on our current predicament.

2 CLIMATE CHANGE AND THE HISTORIC ENVIRONMENT IN SCOTLAND: ACHIEVING TRANSFORMATIONAL CHANGE

Author(s): Davies, Mairi (HES Historic Environment Scotland)

Presentation Format: Oral

As a large public body, Historic Environment Scotland (HES) has duties under the Climate Change (Scotland) Act 2009 that re-

quire it to provide leadership and act as an exemplar by contributing to climate change mitigation and adaptation, and acting sustainably. Stemming from this landmark legislation are regulations, orders, plans and programmes, which provide a robust framework for transformational change across the public sector and beyond. In response to the 2009 Act, our predecessor organisation, Historic Scotland published a Carbon Management Plan in 2011 and a Climate Change Action Plan in 2012. Over a five year period, HS achieved a 17% reduction in greenhouse gas emissions, with a systematic hierarchical approach to delivering savings across its operations. Historic Environment Scotland's Carbon Management Plan increased our ambition, explicitly referencing national and international targets and setting carbon budget for the organisation to 2050. Our new Climate Change and Environmental Action Plan, in development at time of writing, similarly takes an ambitious and wide-ranging approach, recognising the relevance of the Sustainable Development Goals and international reports on progress towards meeting the targets of the Paris Agreement 2015, as well as the necessity of transformational change both internally and across the historic environment in Scotland. It addresses numerous ways in which the historic environment can respond to the challenge of a rapidly warming climate. These include adaptation, the Circular Economy and sustainable development and ensuring that our operations, from travel and commercial activities to building management, minimise greenhouse gas emissions. This approach is intended not just to transform our own organisation but to provide a model that can inspire and inform others across Scotland and beyond.

3 **DECARBONIZING ARCHAEOLOGY: CHOOSING A GOOD PATH**

Author(s): Jensen, Anne (University of Alaska Fairbanks; Bryn Mawr College)

Presentation Format: Oral

Archaeology can inform attempts to strengthen resilience and to adapt to environmental change in a sustainable and culturally appropriate way. However, it currently involves more carbon emissions than are good for the planet. There are obvious means to reduce this, but some of them come with costs.

Conferences are major culprits, but they are also loci of knowledge exchange, and venues for networking and gaining professional exposure, particularly valuable for more junior scholars those who are at smaller and more remote institutions. Alternative means of presentation can substitute for some of these, but how well depends on the connectivity available, which again privileges the centrally-located and well-resourced. Conferences in more remote locations can be positively transformative for researchers. These costs need to be considered and managed as we decarbonize.

Fieldwork practices are also targets for decarbonizing. Increasing involvement with local communities, including for logistical support and excavation assistance could reduce travel and shipping related emissions, as could analysis on site or at the ultimate repository.

4 **APPLYING THE CHAINE OPERATOIRE TO PLASTIC CUPS ; ARCHAEOLOGICAL METHODS FOR CONSUMER PRACTICES**

Author(s): Akerman, Anastasia (University Paris 1 Pantheon-Sorbonne)

Presentation Format: Oral

As archaeologists we are used to considering an object over its lifespan, not just as how we found it. Most of us have spent many happy hours sifting through the rubbish of long-dead people. We know that an object's life begins at the moment of its extraction from a raw material, and can last beyond the end of its use-cycle, disposal, and recovery by archaeologists.

But outside of the excavation we, like everybody else, have long become used to the "throwaway culture" that is characteristic of Western civilisation. Most of us give no further thought to single-use or easily broken, cheap plastic goods once we've used them up and thrown them out. Even though we know that we are doing our descendants no favours. In this presentation I suggest that the Chaine Operatoire be brought into every aspect of life, and the concept be integrated into the way that we manufacture and consume goods. By introducing a way of thinking into society wherein we consider objects not just from the moment we buy them but from the beginning of their production until after we throw them away, we can contribute to a cultural change that will reduce waste and encourage publics to reuse and repair their possessions, as well as helping develop the closed circuit economy.

By introducing this idea into discussions about archaeology in the media, museum expositions and outreach programs we as archaeologists can transform a useful methodological tool into a technique for reducing the impacts of environmental degradation and plastic waste.

5 **AN ARCHAEOLOGICAL APPROACH TO AIR TRAVEL CARBON FOOTPRINT REDUCTION**

Author(s): Rockman, Marcy (ICOMOS)

Presentation Format: Oral

Air travel can be largest piece of a personal carbon footprint. So it is understandable that recommendations for reducing individual carbon emissions emphasize flying less. But where carbon emissions truly matter are at the global level and air travel is organized in a global web. While an individual decision to walk to a destination rather than drive a car does reduce emissions, an individual decision not to fly does not mean that the plane that would have been traveled in does not make a given trip, and consequently those emissions have not been avoided. In this paper, this situation is approached with an archaeological socio-economic network analysis. Starting questions are: how far in advance would how many people would need to decide not to fly on a given route in order for that flight not to occur (or use a smaller plane)? Can an archaeologist find enough information about this in order to make a useful recommendation to professional colleagues? And are there archaeological analogies that can assist

with this analysis and communication of the results? This research is being undertaken for the 2019 EAA annual meeting; results are yet to be determined.

6 ENVIRONMENTAL ARCHAEOLOGY BETWEEN GEOETHICS AND THE RADICAL ENGAGEMENT OF THE ENVIRONMENTAL HUMANITIES

Author(s): Riede, Felix (Department of Archaeology and Heritage Studies Aarhus University)

Presentation Format: Oral

Archaeology always has been as remains to this day a discipline with legs in both the natural sciences – especially geology – and the humanities. Notably, there is an ethical movement underway in the geosciences where some are even suggesting a mandatory no-harm ‘ethical promise’ akin to that of medical professionals; all the while, the humanities are undergoing an ‘environmental turn’, where an increasing number of scholars is arguing strongly for a head-on engagement, scholarly and activist, with contemporary quandaries of climate change. Where does archaeology stand in this? Most previous thinking about archaeological ethics does not relate to climate change, despite the fact that much archaeological research speaks directly to it. While I reject the radically prescriptive approach of an ethical promise, climate change is increasingly putting pressure on practitioners, institutions and disciplines to take individual and collective action. While such action may begin at the individual level, our places of employment (e.g. universities) and our organisations (e.g. the EAA) can act as multipliers of such agency. Ranging from harmless civil disobedience to working in and with the system, I provide a few examples of how we might bring about such disciplinary decarbonisation.

319 SETTLING AT HIGH ALTITUDES. INTRA-SITE AND INTER-SITE VARIABILITY, SITE FUNCTION AND MOBILITY OF HUNTER-GATHERERS AND THE FIRST AGRO-PASTORAL SOCIETIES

Theme: Archaeology of mountainous landscapes

Organisers: Fontana, Federica (Università di Ferrara) - Mangado Llach, Xavier (Universitat de Barcelona) - Cornelissen, Marcel (Universität Zürich)

Format: Regular session

Evidence of prehistoric settlement at high altitude is becoming more and more widespread. This demonstrates humans started occupying mountainous/high altitude landscapes across Europe soon after habitation in these regions commenced and whenever environmental conditions allowed it. Numerous projects developed at both territorial and site level are yielding a varied and rich record, highlighting the variability of settlement choices made at different times and depending on altering landscape use.

This session looks at highland occupation from a site-level perspective in the period spanning from the Palaeolithic to the early Neolithic. It also tries to explore the impact of different natural and cultural changes, such as climatic fluctuations and the shift to agro-pastoral subsistence. It focuses on the function and spatial organization of activities observed at high altitude settlements as well as on patterns of resource exploitation, thus also relating to year-round mobility cycles. By adopting a site-level perspective an important role will furthermore be played by data concerning dwelling structures, as well as artefact and ecofact chaînes opératoires, linking indirectly to activities taking place both within and beyond the studied sites themselves.

ABSTRACTS

1 EARLY HUMAN OCCUPATION OF HIGH-ALTITUDE PERUVIAN ANDES DURING THE TERMINAL PLEISTOCENE: CUNCAICHA ROCK SHELTER AS A RESIDENTIAL BASE CAMP

Author(s): Osorio, Daniela (Institute of Archaeology, University College London) - Rademaker, Kurt (University of Michigan) - Moore, Katherine (University of Pennsylvania) - Zarrillo, Sonia (Cotsen Institute University of California Los Angeles)

Presentation Format: Oral

The high-altitude Andes (above 2,500 masl) has been an area classically rejected as a space for the early occupation of South America because of its extreme environmental conditions, which include cold temperatures and hypoxia. Therefore, most models for the initial peopling of this area propose a later exploration of the highlands, mainly done by logistical parties of hunter-gatherer groups that would first have settled on the coast or in the lowlands.

Contrary to these ideas, this paper presents the study of Cuncaicha (4,480 masl), one of the oldest sites of the Peruvian highlands, and explores the different lines of evidence including faunal, lithic and botanical remains, to show that hunter-gatherer societies occupied the site as a residential base camp as early as 12,500 years cal BP. We examine the connection between site function assumptions, which are defined mainly using lithic indicators, and mobility implications presented usually as collector vs forager strategies and ephemeral vs permanent occupations. Based on the different activities identified in Cuncaicha, and on the detailed study of the lithic chaînes opératoires, we define specific features of this high-altitude Andean early occupation and suggest a more empirically rigorous approach to interpret site functions. We propose the development of an early human adaptation in the area and consequently the creation of a human landscape during the Terminal Pleistocene.

2 SETTLEMENT DYNAMICS AT HIGHLAND OPEN-AIR PERSISTENT PLACES. THE EVIDENCE FROM CASERA STAULANZA (VENETIAN DOLOMITES, NORTHERN ITALY)

Author(s): Fontana, Federica - Visentin, Davide (Università di Ferrara) - Bassetti, Michele (CORA Società Archeologica s.r.l.) - Bertola, Stefano (Università di Ferrara, Università di Firenze) - Mozzi, Paolo (Università di Padova) - Sangiorgi, Carlo - Soncin, Alice - Turrini, Maria Chiara (Università di Ferrara)

Presentation Format: Oral

Persistent places are a typical feature of highland territories. Such locations, occupied by human groups several times, in some cases for centuries or millennia, correspond to areas where favorable topographic and landscape attributes occur simultaneously (flat surfaces, good visibility, water sources etc.). Most frequently this situation has been documented in rock-sheltered sites representing well recognizable landmarks which have allowed, in most cases, the formation of stratigraphic series of variable thickness in which each layer corresponds to a diverse occupation phase. But what happens when open air locations are repeatedly settled over time in areas which are usually characterized by low sedimentation rates? In this paper this aspect will be discussed taking as a case study the open-air site of Casera Staulanza in the Venetian Dolomites (Northern Italy). This site is located on a flat ledge next to a moraine ridge and close to a major pass, at an altitude of 1681 m a.s.l. The stratigraphic sequence allowed recognizing two main pedogenetic phases: a Lateglacial one and the present soil, both heavily affected by bioturbation. Archaeological investigations carried out over an area of about 30 m² have allowed recovering a rich lithic assemblage from the two soils, along with several charcoal fragments. Some archaeological features were also identified. While the analysis of the lithic assemblage indicates a main Late Palaeolithic occupation, radiocarbon dates carried out on charcoal samples refer to Early Mesolithic, Copper Age and Medieval times. In order to test the possibility of identifying different occupation phases and locating them in space, a multidisciplinary study has been carried out including the analysis of the provenance of lithic raw materials, a techno-economic and functional study of the lithic assemblages and a spatial distribution with GIS of all the recovered items.

3 WHEN MEN AND MOUNTAINS MEET. THE INNER ALPINE LANDSCAPE KLEINWALSERTAL AND ITS USAGE DURING THE MESOLITHIC

Author(s): Posch, Caroline (Department of Archaeologies, University of Innsbruck)

Presentation Format: Oral

The region Kleinwalsertal features one of the largest concentration of Mesolithic find spots in the province of Vorarlberg (Austria). The sites consist mostly of superficial flint scatters located between 1200 and 2100 m a. s. l. within different habitats and vegetation zones. Their discovery during the last 30 years can be credited to various local collectors and research groups. Since 2016, the sites are the subject of the author's doctoral project "The Kleinwalsertal. A Mesolithic landscape with far reaching contacts", funded by a DOC-scholarship of the Austrian Academy of Sciences (ÖAW).

The northern Austrian Alps form a bridge between the Mesolithic of Southern Germany and Northern Italy. We know of contacts between the regions, but we know little about the chronology and the ways in which these "borderlands" were occupied. The project therefore seeks to generate basic and comparative data regarding these questions in particular and the Mesolithic of Western Austria in general.

The archaeological sites, and their relationship with and the usage of the surrounding landscape form its key objective. They are not simply dots on a map, but part of the landscape, intertwined with its possibilities and limitations. To get as complete a picture as possible, the sites and their artefacts are studied in a holistic approach. It includes an examination of the morphological position of the sites within the landscape via field surveys and subsequent GIS-analysis. Furthermore, an intra site analysis concerning the excavated sites Schneiderküren, Egg-Schwarzwasser and Bärämähder is conducted. The lithic artefacts are analysed with regard to their technological and typological characteristics, as well as raw material provenance. The synthesis of the data will deal with questions concerning the function of the sites, the landscape usage and mobility patterns throughout the Mesolithic in the region and to areas farther abroad.

4 'BECAUSE IT'S THERE': MODELLING SITES, MOBILITY, LITHIC CHAÎNES OPÉRATOIRES AND CULTURAL PERSPECTIVES IN A MESOLITHIC MOUNTAIN LANDSCAPE

Author(s): Preston, Paul (Lithoscapes Archaeological Research Foundation)

Presentation Format: Oral

Traditionally the interpretations of hunter-gatherer habitation of mountain landscapes have been restricted to ideas and methods that are considered incompatible (e.g. post-processual [social/cultural] versus processual [functional and economic]) perspectives. Archaeologists usually employ these ideas without explicit hypotheses, and when tested they tend to concentrate on a single artefact or ecofact type and often from just one site. Consequently, this paper takes the best processual, post-processual, and scientific aspects of the study of mountain landscapes and merge them, as a proof of concept, into an explicitly defined, scientifically rigorous yet culturally and economically engaged polythetic model. The Sites, Landscape, Mobility, And Material-Culture Model is then tested using data from 792 Mesolithic sites/assemblages from the Pennine Mountains of England. Showcasing the results, it reveals hitherto unappreciated interpretations of the flexible ways that Mesolithic people inhabited highland landscapes. It concludes that the hunter-gatherer groups situated sites on a network of traditionally used transit routes, adjacent to repeatedly visited and highly socially and practically invested in culturally significant landmarks and places. In turn, it intimately links interplays of on/offsite knapping, high levels of landscape-wide lithic importation, coupled with

an increased occurrence of flexible knapping strategies, raw material availability, risk, mobility strategies, and cultural practices.

5 THE LAST HUNTERS OF THE KARWENDEL

Author(s): von Nicolai, Caroline (Ludwig-Maximilians-Universität München)

Presentation Format: Oral

Since 2016, an open campsite is excavated in the Austrian Karwendel Mountains, the largest range of the Northern Calcareous Alps, which is located between the Isar and Inn rivers, at the German-Austrian border. The campsite is situated at an altitude of 1800 m asl and has yielded fireplaces, stone artefacts and animal bones. The raw materials of the stone artefacts indicate that the hunters and gatherers using this site either maintained extended exchange networks, ranging from Bavaria to Northern Italy, or that they travelled themselves over very long distances. Interestingly, the radiocarbon dates suggest that the site was frequented during the Mesolithic as well as during the Early/Middle Neolithic. This means that a (Post-) Mesolithic lifestyle was practiced far into the Neolithic period in this area. A pollen analysis from the nearby valley bottom seems to confirm this assumption. So this site constitutes a good example to study both the mobility of hunter-gatherers and the beginning of agropastoral activities at high altitudes in the Central Alps.

6 EVIDENCE OF PREHISTORIC SETTLEMENT AT Cerdanya Valley (Eastern Pyrenees): FROM HUNTER-GATHERERS TO AGROPASTORAL SOCIETIES

Author(s): Mangado, Xavier - Oms, Francesc Xavier (SERP. Universitat de Barcelona) - Sánchez de la Torre, Marta (Dpto. Ciencias de la Antigüedad - PPVE. Universidad de Zaragoza; SERP. Universitat de Barcelona) - Aliaga, Sara (Consell Comarcal de Cerdanya)

Presentation Format: Oral

The Cerdanya valley is the widest southeaster Pyrenean valley. The archaeological record of the area chronologically begins with a set of three side-scrapers of quartzite recovered from Olopte cave (Isòvol), without stratigraphic context, but typologically related to the Middle Palaeolithic. The upper Palaeolithic open-air site of Montlleó (Prats i Sansor) at 1.140 m asl, is nowadays the most ancient example of recurrent hunter-gatherer's occupation of this valley. The analysis of the stratigraphic sequence related, on one hand, with several radiocarbon dates ranging between the 23.000 and 18.000 calibrated BP, and on the other hand, with the techno-typological analysis of the lithic industry, allow us to determine two stratigraphic levels of occupation. The oldest, corresponding to the end of the LGM is culturally related to the Badegoulian -or the Later Upper Solutrean-; and the more recent one could be correlated to the lower Magdalenian. The archaeopetrological analyses and the procurement strategies of hunter-gatherer societies allow us to consider that probably the site was a crossroad for materials and influences during that period. Unfortunately, there are not evidences of Mesolithic occupation sites at the Valley, only the rock-shelters of la Vall d'Inglà (Bellver de Cerdanya) have provided a set of many red and brownish abstract pictograms of simple lines and digitations, that have been attributed to that period.

The occupation of the valley by agro pastoral societies took place in the open air site of Mines de Sanavastre (Das) where many structures and pottery shreds were recovered corresponding to the Postcardial Neolithic (V millennia cal BC). Our recent works bring to the light a new site, in this case dating from the middle-final Neolithic, with burial purposes. The Tutes de Menús Cave.

7 THE SHAPE OF MOUNTAINS: SETTLEMENT AND CIRCULATION IN NW ARGENTINA AT THE ONSET OF SEDENTARY LIFEWAYS (CA. 1500 BC-AD600)

Author(s): Lazzari, Marisa (University of Exeter) - Korstanje, Maria (Instituto de Arqueología y Museo, Universidad Nacional de Tucumán, Argentina; Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET)

Presentation Format: Oral

The Andean region provides a unique record of human habitation in high-altitude areas. Although camelid-assisted mobility gradually developed over the long term, these practices were very different from the mobile lifeways observed in other high-altitude settings in the world. In the south-central Andes, archaeology and cognate disciplines have proposed a variety of settlement and mobility models, emphasizing the increasing role of llama caravans as the connective agents across its starkly diverse landscape. The Formative period (ca 1500 BC-AD600) in NW Argentina (NWA) is of interest as a time when new technologies and forms of settlement emerged, based on access to the exploitation of diverse microenvironments. Combining sedentism with varying degrees of residential mobility, these communities built upon the legacy of long-distance movements of the earlier hunter-gatherers and created a new social landscape. Fueled by their increased productive capacities and their ability to maintain social bonds through exchanged materials, these new practices shaped the topography of this mountainous area in unprecedented ways.

Traditional approaches have proposed the increasing centralization of interaction through the ability of some areas of NWA to control agricultural surplus, craft production and regional traffic. Based on typological similarities and vague assumptions on agricultural practices, these interpretations have left much to speculation. Focusing on key sites in the El Bolsón Valley and the southern Calchaquí valleys area of NWA, we discuss archaeometry, artifact analysis, paleoecology, and environmental evidence to provide a multi-scalar view of community production and reproduction, thereby offering an alternative approach to this period in the region. Formative period communities were highly creative, generating enough resources to support both internal and regional networks of cooperation and alliance, and to circumvent or even undermine those that sought to concentrate power and

321 MOUNTAIN AND CITY, NATURE AND HUMAN BEING. A MUTUAL CONDITIONING BETWEEN HUMANS AND LANDSCAPE DURING THE ROMAN PERIOD

Theme: Archaeology of mountainous landscapes

Organisers: Canino, Dario (Universitat Autònoma de Barcelona; Sapienza Università di Roma) - Trivelloni, Ilaria (UNIL - Université de Lausanne; Sapienza Università di Roma) - Migliorati, Luisa (Sapienza Università di Roma) - Fuchs, Michel (UNIL - Université de Lausanne)

Format: Regular session

This session will explore the topic through different case-studies of cities and infrastructures in mountainous regions during the Republican and Imperial periods, in order to highlight the variety of possible interactions between human communities and these specific environments. Archaeology provides a valuable wealth of still-visible evidence for landscape transformations in mountain areas.

The aim of this session is to understand how urbanistic choices, either determined by the central authority or carried out by individuals (e.g. benefactors), altered the environment, and how buildings and structures have been shaped in their architectural features to adapt to the local morphology. Alpine regions or other mountain areas highly affect the planning and the arrangement of cities. The necessity of overcoming relevant natural constraints determined a variety of peculiar architectural choices and works.

We welcome papers that innovatively explore the position and building technique of structures for public utility (hydraulic structures, defensive systems, entertainment buildings as well as buildings serving religious, administrative and commercial purposes) in Roman cities. A particular emphasis should be given to the construction technique in relation to the physical geography of mountain areas. For this specific topic it is important to address the reasons why a structure has been built in a particular location, instead of elsewhere.

Papers can address Alpine regions or other mountainous areas within the limits of the Roman Empire. A round table will follow the presentations, in order to promote discussion and to identify similarities and differences among the case-studies presented in the session.

ABSTRACTS

1 PUBLIC BUILDING AND MONUMENTALIZATION OF ROMAN CITIES IN THE ALPS: EPIGRAPHY AT THE SERVICE OF TOPOGRAPHY

Author(s): Trivelloni, Ilaria - Dell'Era, Romeo (Unil - Université de Lausanne; Sapienza Università di Roma) - Gregori, Gianluca (Sapienza Università di Roma)

Presentation Format: Oral

From the end of the 1st century BC onwards, a progressive monumentalization (a greater development of public architecture) can be observed in Roman cities. In the Alpine centres, whose situation in a high mountainous landscape was also relatively new for Romans, this phenomenon occurs at an even faster and stronger rate. These territories became points of connection and exchange between Italy and the Northern provinces of the Roman Empire.

Political choices are reflected in the urban planning and are strongly influenced by the geographical and morphological context. It becomes apparent that the dynamics of the settlement development in areas strongly characterized by mountainous landscape led to specific planning choices. Although Roman cities in the Alpine valleys were mostly founded in flat areas close to rivers, the attachment to the mountain was constant.

The sources of information for this question are mainly archaeological. Many Roman cities in the Alps correspond to modern towns, so ancient topography is known from several urban excavations. Nonetheless, Latin inscriptions, mostly found as spolia related to ancient public monuments, sometimes reveal interesting details about their construction, reconstruction or restoration.

The innovative approach of this contribution relies on the interaction between topographic (archaeological) and epigraphic research. We will examine the urban development of Roman cities in the Alps from the Augustan age to Late Antiquity, comparing their geographical and topographical context with their epigraphic material. Our research will include cities with different juridical statuses, located both in Roman Italy and in the provinces that are strongly connected to mountainous landscape.

2 TERRACED CITIES, LARGE BUILDINGS, ADAPTIVE AND ADAPTED CONSTRUCTIONS: THE CASE OF OTRICULUM (OTRICOLI, UMBRIA TR)

Author(s): Antonelli, Giacomo (Sapienza - University of Rome)

Presentation Format: Oral

Since its first phases, the Umbrian settlement of Otriculum is established on the top of the hill where the modern city of Otricoli still remains. This position was useful even to control the port on the Tiber that made the wealth of this little town, together with

the consular road.

The landing was in a river bend 160 m lower and about 1 km west to the city; today the Tiber flows even more to the west and the port doesn't exist anymore since mid-19th century. South of its site there is a huge tufaceous plateau, crossed by a little stream named San Vittore. The latter dug in soft tufa a deep valley up to the Tiber river.

Between the 1st century B.C. and the 1st century AD, the Roman municipium experienced a massive monumentalisation exactly on the above-mentioned plateau. The regularization works were very impressive and the buildings, still remaining, are suitable for a very important city: it proves the richness of this city, despite its small size.

Huge vaulted substructions like those of Hellenistic Sanctuaries in Lazio; theatre and amphitheatre leant against and supporting the tufa slope; a monumental wall (identified as a nymphaeum) hiding an elaborated system of reservoir and hydraulic structures that supplied water to the city; last but not least an impressive underground channel in which still flows the San Vittore stream. All these constructions allowed the creation of a big terraced town along the Tiber valley. Even the port structures had to arrange themselves on more levels: in fact, there are many archive documents showing how, still in the 18th century, cranes and gantries were designed for carrying products from the landing, at 40 m a.s.l., up to the road to the city, at more than 80 m a.s.l.

3 THE HOUSE OF LIVIA ON THE PALATINE HILL: THE ART OF BUILDING'S CONSTRUCTION ON A DOUBLE SLOPE

Author(s): Torrisi, Valentina (Sorbonne Université)

Presentation Format: Oral

The House of Livia, the emblematic late republican domus located on the Palatine Hill, was constructed over a double incline/ slope from north to south and the north-west to south-east. In this proposal, I offer an analysis of the architectural solutions used during the House's construction to resolve issues of 'dénivellation' and to adapt building methods to the natural topography of the Hill. The first and most immediately obvious issue facing the construction was the water run off from the top Hill, circumvented by the digging of substantial canal systems underneath the structure of the domus itself as well as the creation of multiple cisterns. Only the deeper underground foundations (around 7m) remain of the House of Livia which were treated differently according to their respective zones (north-west sector containing the painted walls equipped very probably with 'Bocca di lupo' windows and the south-east sector with its dual level superimposed foundations). The builders responsible for the construction of the House of Livia would have too benefitted from the rich experience provided by the frequent usage of artificial terracing, by that time a commonly implemented feature used by Roman architects for already two centuries.

4 THE FORTRESS OF MAREC IN THE REPUBLIC OF KOSOVO AND ITS LANDSCAPE

Author(s): Rama, Zana (Archaeological Institute of Kosovo)

Presentation Format: Oral

This paper focuses on the role of landscape on fortifications built on mountain peaks in the territory of Kosovo. It analyses the role of the mountains in these structures, in the protection, and in the opportunity to create communication with other fortresses.

Republic of Kosovo is located in southeast Europe, on the Balkan Peninsula. Its routes of civilization go back in the prehistory, from the Neolithic, Eneolithic, Bronze and Iron Age. In the past, this territory was known as Dardania. After the fall of Dardania under the Roman Empire, a number of urban towns were developed. In the Late Antiquity (4th - 6th century) due to the different tribe attacks, the population started to abandon the towns, and relocate in hills and mountains, for better protection. According to Procopius of Caesarea in "De Aedificiis", during the rule of the Byzantine emperor Justinian the Great, 61 fortifications were reconstructed and 8 were constructed in the territory of Dardania.

This paper analyses the link between mountains and fortresses, the natural protection strengthened with human built walls, by taking as a case study the Fortress of Marec in Kosovo: a Late Antiquity fortress, located on the peak of a hill, 910 meters above the sea level. The paper will present the archaeological results by so far, since the excavations are still ongoing.

5 THEATRE IN ROMAN ITALY

Author(s): Migliorati, Luisa (Sapienza Rome University)

Presentation Format: Oral

The relationship between theatres and cities is a topic still to be deepened. Many are, in fact, the aspects that should be considered and above all that each city is characterized by its own history and its urban development.

Starting from the Augustan age the theatre became a symbol of the Roman city. The importance of this monument typology is underlined also by Vitruvius. He describes this building for spectacles immediately after the description of the forum area, giving suggestions on its construction.

However, the archaeological reality often doesn't correspond to the urban model defined by the Roman architect. The main problems are related to the choice of the site where the theatre should be built. There are numerous aspects that determine the choice of the place of construction. Particular attention should be given to the geo-morphological aspects, to the possibility of recovering construction material locally, to the availability of water, etc. All these factors were relevant to avoid problems related also to economic aspects. Specifically in urban settlements included in mountainous landscape, the attention to the geograph-

ical element is even more evident.

The analysis on the relationship between theater and city will be developed through some examples of Roman cities in Italy.

6 FORA IN MOUNTAINOUS AREAS: PROGRAMMING AND RE-FUNCTIONALIZATION OF PUBLIC SPACES IN ROMAN CITIES

Author(s): Canino, Dario (Universitat Autònoma de Barcelona - Sapienza Università di Roma)

Presentation Format: Oral

The paper analyses the substantial operations of modification of the previous territorial or residential areas following the new Roman foundations.

In every new Roman city, the area in which was built the forum had to be programmed since foundation. Especially in mountainous contexts, the realization of the most important urban public space has constituted a very fertile ground for the inventiveness of the Roman builders and for the realization of innovative architectural solutions.

The irregular topography, in fact, has often determined a typology of complex with scenographic characteristics. As result, appears clearly a substantial difference between these fora and the ones realized in regular and orderly urban systems that instead were built in cities on the plains.

Moreover, the planning of the major urban public area did not necessarily correspond to a contextual extensive monumentalization work. Particularly demanding and expensive building works were possible, in fact, only in the case of adequate financial resources and certain legal conditions. Characteristics that are linked to the existence of a rooted local elite.

Therefore exists a strong relationship between the phases of foundation and restructuring of the Roman cities and specific economic and legal conditions of the city itself.

The analysis of this theme is carried out in the paper through some significant examples of Roman cities in Italy and in Spain, which were founded on articulated landscapes from orographic point of view.

A. HOW TO DEAL WITH NATURAL CONSTRAINTS, A ROMAN SET UP ON MOUNTAINOUS LANDSCAPE AROUND DURANCE VALLEY (FRANCE)

Author(s): Raynaud, Karine (APASA) - Gautier, Laure (Aix-Marseille University)

Presentation Format: Poster

This poster present results of field archaeological projects leaded in southern French Alps on both side of Durance valley and watertank of Serre-Ponçon.

Used methodology cross together survey, excavations, archives research and aerial views, giving new datas for roman period in this area. Connection between rural and urban settlement, focused around major Roman routes, is continue from low river landscapes to high pastures places, including stone quarry points, water management and strategic postitions. But most of all, soil quality seems to stay a major attractive condition, following housing locations from protohistoric times. Through these new data obtained in a quite unknow area, roman paradigmes have been given to communities with a good eye on local specificities. If some of them last in time, others didn't pass the antiquity period as this landscape can not stay artificial without a strong maintenance. To put a end, this field approach seem how it is necessary to investigate low, median and high places as well, in a way to understand all components of historical occupations.

B. THE BUILDING MATERIALS OF AUGUSTA PRAETORIA (AOSTA, ITALY): RELATIONSHIP BETWEEN CITY AND TERRITORY

Author(s): Castoldi, Maurizio (Università degli Studi della Basilicata) - Armirotti, Alessandra (Soprintendenza per i Beni e le Attività Culturali Regione Autonoma Valle d'Aosta - Ufficio Patrimonio Archeologico)

Presentation Format: Poster

The colonia of Augusta Praetoria Salassorum was founded in 25 BC at the top of the Romanization process of the northwestern Alps, in order to seal the control of some of the most important mountain passes to the transalpine regions. The original layout of the city, built on the back of a natural basin and along the middle course of the Dora Baltea, provided a rather essential monumental panoply, within a regular urban network of 64 insulae. The most important public complexes of Aosta, concomitant with the foundation, are the forum, with a sacred area and a platea civica, probably a square with a temple and a quadriporticus, and the city walls with the four turreted entrances. The supply of lithic material for the construction of the Augustan urban plan probably required a rather intensive anthropic impact, concentrated near the suburbium of the city: local materials such as a travertine limestone and a conglomerate traditionally known as "puddinga" were both the object of cultivation in quarries not far from Aosta. The local bardiglio, a blue-grey marble extracted a few kilometers from the colonia, was the main lithic material of the Augusta Praetoria "monumentalization" period, in the middle of the first century AD: it was heavily used for structural and decorative elements in the existing complexes and in the new buildings, such as the thermae, the Theater and the Amphitheater.

Theme: Digital archaeology, science and multidisciplinary: new methods, new challenges

Organisers: Anvari, Jana (Institute of Prehistoric Archaeology, University of Cologne) - Biehl, Peter (Anthropology, University at Buffalo, State University of New York) - Rosenstock, Eva (Institute for Prehistoric Archaeology, Freie Universität Berlin)

Format: Regular session

Increasingly, archaeological projects are multi-disciplinary, multi-institutional and multi-national collaborations that rely on the productive exchange of data and ideas between geographically disparate project members. The ever-growing amounts of digital data they produce necessitate dedicated management and archiving plans, which are handled in very different ways depending on funding institutions, national or state regulations - despite efforts to develop transnational standards (e.g. ARCHES). Some projects wish to share some or all their data and results online with a larger audience via social media or online archives. This requires them not only to find the resources to do so, and to maintain the data, but also to address intellectual property guidelines stipulated by antiquity legislation, involved institutions, funding bodies and publishers. There is also a need to discuss best practices regarding issues of access to finds and data for future scientific research. This session invites papers that reflect on the multiple managerial, ethical and legal challenges as well as opportunities involved in organising, archiving and sharing archaeological field data and research results. It welcomes theoretical contributions as well as reports of own work and experiences either from active fieldwork projects or from projects working with archaeological legacy data.

ABSTRACTS

1 FIELD SCHOOLS IN THE DIGITAL WORLD: A VIEW FROM NORTH AMERICA

Author(s): Boytner, Ran (Institute for Field Research)

Presentation Format: Oral

Field schools have been the mainstay of archaeological praxis for over a century. In North America, most field schools were traditionally organized by universities and took place across the world. Students enrolled through word of mouth or by taking classes with the field school instructor. But the world of field schools dramatically changed by the digital revolution, especially in North America. Beginning with Shovelbums.org, later with the Archaeological Institute of America (AIA) and now with the new American Anthropological Association (AAA) AnthroGuide, field schools information was put online and students became empowered to search, explore and enroll to hundreds of programs online. This digital revolution also yielded the birth of academically independent field school organization, utilizing the reach of the digital world and the very low cost of entry to create economies of scale and offer huge selection and new types of field schools. This paper will explore the history of the digital field school portal and its dramatic impact on offerings, quality and funding for archaeological research. The collaborative nature of field work will not be considered here at the level of individual projects but at the level of the entire sector, providing bird's eye view of trends shaping the archaeology practice of the future.

2 A LEGACY WORTH COLLABORATING WITH/OVER

Author(s): van Helden, Daniël (University of Leicester)

Presentation Format: Oral

Material excavated a century ago has no less bearing on the past than newly unearthed data. So archaeology is in the relatively rare position that century-old data is relevant to our current questions. Of course, today we excavate –and administrate! – to different standards and with very different questions in mind, but problematically, we cannot re-excavate old data. If we are to capitalise on archaeology's extraordinary position of an ever expanding dataset, we need to include these legacy data into our analyses.

The upshot of this ever expanding mound of data is that it increasingly requires multiple people to effectively collate and analyse it. Using experience gained while developing an ontological database in the context of the Big Data on the Roman Table research network as illustration, I will touch on important issues of collaboration (streamlining goals within the project) and usability within and beyond a particular project. The latter two lead to the importance of flexible tools that will bear adaptation to use disparate data for different aims and questions. In other words, not only do we need to cooperate within a given project, but ideally also across projects and time if we are to avoid re-treading the same ground over and over again. In this paper, the tool I will be illustrating these points with will be the ontological database developed for the BDRT research network.

3 SEMANTIC WEB APPLICATIONS AND PUBLIC OUTREACH. EXPLORING THE ÇATALHÖYÜK DATABASE

Author(s): Marciniak, Arkadiusz - Filipowicz, Patrycja - Harabas, Katarzyna - Hordecki, Jędrzej (Adam Mickiewicz University)

Presentation Format: Oral

The storage, curation and sharing of large, complex and diverse data acquired during 25 years of excavations at Çatalhöyük poses a real challenge. In this paper we aim at discussing the relevance of this multifaceted database for the purposes other than research goals advocated by the Çatalhöyük Research Project and not explicitly designed by its creators. It will exemplified by the analysis of two major applications: Seshat and Hatch.

Seshat is the massive collection of historical information allowing the rigorous testing of different hypotheses about large-scale societies across the globe and human history. It was developed in the era of big-data. It extracts the data from a combination of databases, Linked Data, web sites, academic publications and human experts. The paper shall discuss possibilities of harvesting complex archaeological databases, such as Çatalhöyük datasets, and conforming information to other structured or semi-structured formalisms and map it to the RDF data model. Some emerging challenges comprise e.g. changing research perspectives from micro (site) to macro levels or transition from 'raw' excavation data to more complex variables.

Hatch it is an advanced and innovative class of systems designed to create and maintain digital collections. It is aimed at presenting a wide range of data about Çatalhöyük in a multiscale and interactive form, linking information of different characters (types of objects, relations among them, etc.) with different forms of their presentation (text, photographs, graphics, etc.). It has didactic objectives and is designed to meet the needs and expectations of both professionals and the general public interested in the human past. The paper will discuss the relevance and usefulness of Çatalhöyük datasets for the purpose of this multi-dimensional interactive open digital educational collection. In both cases, the multiscale problems of intellectual property right will be critically evaluated.

4 **CREATING REUSABLE DATA: A VIEW FROM THE TRENCHES**

Author(s): Austin, Anne (University of Missouri - St. Louis) - Kansa, Sarah (Alexandria Archive Institute)

Presentation Format: Oral

Archaeologists share an ethical obligation to publish, archive, and share their field data and research results. One expectation of making archaeological data publicly available is its eventual reuse. Yet, research into archaeological data reuse demonstrates that building accessible data repositories does not necessarily result in substantial reuse of archaeological data (Huggett 2018). What limitations prevent archaeological data from reuse and how can these be addressed during and after archaeological fieldwork?

The Secret Life of Data (SLO-data) project follows the lifecycle of data from the field to the digital repository to better understand opportunities and challenges in data interpretation, publication, and reuse. We use a mixed-methods approach of interviews, field observations, and excavation data assessments to identify the challenges faced by four different archaeological sites around the world. Our subjects are international teams comprised of senior excavation staff, students, registrars, and specialists, all engaged with data creation, but sometimes asynchronously and with personnel changes from year to year. In this paper, we report common findings that impeded archaeological data reuse across these four projects based on interviews and observations conducted during the 2016-2018 field seasons. We then review how technical and organizational adjustments that resulted from these findings impacted data creation and management practices at each site. We conclude with a discussion of how these findings can be applied to archaeological projects more broadly to better streamline data collection during fieldwork and in the lab for project sharing and eventual reuse.

Works Cited

Huggett, J. (2018). Reuse Remix Recycle: Repurposing Archaeological Digital Data. *Advances in Archaeological Practice*, 6(2), 93-104. doi:10.1017/aap.2018.1

5 **WORKING TOGETHER TOWARDS BETTER STEWARDSHIP OF DIGITAL ARCHAEOLOGICAL DATA WITH SEADDA**

Author(s): Wright, Holly - Richards, Julian (University of York) - Ronzino, Paola (PIN S.c.r.l., Polo Universitario di Prato)

Presentation Format: Oral

Making archaeological data open and freely accessible is a priority across Europe, but the domain lacks appropriate, persistent repositories. Due to the fragility of digital data and non-repeatable nature of most archaeological research, archaeology is poised to lose a generation of research to the Digital Dark Age. The key to mitigating this crisis is to bring archaeologists and data management specialists together to share expertise, and create resources that allow them to address problems in the most appropriate way within their own countries. While important international standards exist and should be used, there is no single way to build a repository. To be successful, archaeologists must be at the decision-making heart of how their data is archived to ensure re-use is possible. This paper will introduce the newly funded COST Action SEADDA (Saving European Archaeology from the Digital Dark Age) which will work to create a priority research network on the archiving, dissemination and open access re-use of archaeological data, and includes participation from over 30 countries. SEADDA brings together an interdisciplinary network of archaeologists and computer scientists; experts in archaeological data management and open data dissemination and re-use. SEADDA will allow archaeologists from countries with archiving expertise to work with archaeologists with few or no available options, so they may share knowledge, create dialogue within their countries, and move forward to address the crisis. This paper will also discuss ways in which EAA members can participate and benefit from the Action.

6 **INTERNATIONAL ACCESSIBILITY AND ISSUES OF OWNERSHIP OF 3D ARTIFACT REPRESENTATIONS**

Author(s): Garstki, Kevin (University at Buffalo, SUNY) - Frie, Adrienne (University of Wisconsin-Oshkosh)

Presentation Format: Oral

During the late 19th and early 20th centuries, antiquarian excavations in Southeastern Europe and the Mediterranean took place under the auspices of the German, Ottoman, and Austro-Hungarian Empires. Such excavations provided the foundational ar-

chaeological collections of many museums in Europe and the United States. These artifacts are still held by these museums, and due to issues of distance and limited research funds, have remained largely unavailable to local scholars and the public in the countries of origin. This has been the case with the Mecklenburg Collection, which was excavated prior to World War I by the Duchess of Mecklenburg when the territory of Slovenia was part of the Austro-Hungarian Empire. The project, Visualizing Antiquarian Excavations: Digital Repatriation of the Mecklenburg Collection, aims to provide digital access to this collection through an open access data publisher that will include digital 3D representations, high resolution photographs, and scans of the archival excavation documentation. Yet this collection, which spans multiple institutions and countries, is a nexus for numerous stakeholder groups who differ on views of accessibility of artifacts through digital media. In this paper we will discuss how dissemination, ownership, and data preservation is being approached with digital 3D representations of cultural heritage in this project.

7 DUSTING OFF ANCIENT ANTHROPOMETRIC DATA BANKS: INTEGRATION OF THE MAINZ ARCHIVE AND GENEVA ADAM WITHIN THE LIVES COSTA ONLINE DATABASE

Author(s): Ebert, Julia - Rosenstock, Eva (Institute of Prehistoric Archaeology, Freie Universität Berlin)

Presentation Format: Oral

The research project LiVES (living conditions and biological standard of living in prehistoric Europe and South West Asia) focuses on human stature as a possible reflection of general living conditions, health and diet in prehistory. While during the first few years the project maintained its own original database compiled from literature, datasets from two already existing, slightly antiquated data collections were later acquired and converted in order to obtain a sufficient amount of data relating to prehistoric body heights: the Mainzer Lochkartenarchiv für prähistorische und historische Anthropologie (Mainz punch card archive for prehistoric and historic anthropology) and the Geneva-based Anthropological Data Acquisition and Management (ADAM). All three collections were integrated within a new and updated online database LiVES-COSTA (LIVES Collection of Osteological Anthropometry) which, aside from our own purposes, is intended for future use by academic institutions and individual researchers around the world. With checked and published data from 6449 skeletal individuals dating up to 600 cal BC, and a total of 18.127 unchecked, unpublished skeletal entries mostly dating to later periods, it is currently the largest digital collection of prehistoric and historic long bone and stature data from Europe and Southwest Asia. In this talk we will give a detailed report on the data acquisition and integration process and describe the structure, as well as the state of the database and address questions regarding lasting data accessibility, correct crediting of data producers and compilers and ethical issues with modern data.

8 STRATEGIES AND CHALLENGES IN THE ARCHIVE OF BIOMOLECULAR DATA

Author(s): Hendy, Jessica (Department of Archaeology, University of York; Max Planck Institute for the Science of Human History)

Presentation Format: Oral

The field of ancient DNA has made a profound impact on the field of archaeology, and the ever-increasing production of DNA data, as well as the emergence of “genomics factory” laboratories, is a divisive subject in archaeology (Lewis-Kraus 2019). One issue in this divide surrounds how genomics data should be archived and distributed; who owns this data, and how can it be made accessible (or should it be made accessible) for multiple, differing interest groups? This paper articulates some of the approaches that the field of biomolecular archaeology utilizes to archive and access data, and reflects on some of the challenges in this archiving and distribution, especially with regards to communication with colleagues in adjacent disciplines and different interest groups. In the experiences of the author, while there is a general willingness to make raw data available, alienation between different research groups can arise due to a lack of mutual understanding or appreciation about terminologies or jargon, differing approaches to research conduct, and what is deemed a productive research output in different academic environments. Moreover, such raw biomolecular data may only be of use, at least at present, to other groups working with similar data types, and who have the financial and computational capacity to re-analyse such data. Fundamentally, data archiving should not simply be a “tick box” exercise, and is a research step that requires forethought, careful consideration of different interest groups and flexibility. Lewis-Kraus, G., 2019. Is Ancient DNA Research Revealing New Truths — or Falling Into Old Traps? The New York Times.

9 ISOMEMO: A PARTNERSHIP-BASED MODEL FOR BIG ISOTOPIC DATA

Author(s): Rosenstock, Eva (Einstein Center Chronoi, Berlin; Institute of Prehistoric Archaeology, Freie Universität Berlin) - Fernandes, Ricardo (Max Planck Institute for the Science of Human History; School of Archaeology, University of Oxford; Faculty of Arts, Masaryk University)

Presentation Format: Oral

IsoMemo (<http://www.isomemo.com>) is a Big Data initiative bringing together several repositories of isotopic data from various research fields including archaeology. IsoMemo follows a partnership-based model in which autonomous repositories are responsible for defining metadata and collecting data according to specific research needs. Within archaeological research this implies that repositories select data for collection according to cultural, geographical, and chronological criteria.

The IsoMemo initiative promotes the production and open access to isotopic data and the development of new databases having developed the concept of source recognition for both data producers and compilers. It also coordinates data collection among partners and develops open access tools for data search and data mirroring to ensure its long-term accessibility.

Another major feature of IsoMemo is the development of new statistical tools for the analysis of Big isotopic Data and data

integration of isotopic and non-isotopic datasets leading to the development of large-scale interdisciplinary projects. In this paper, the IsoMemo organizational model will be described and several examples will be presented to illustrate the archaeological potential of the initiative.

10 LIKE A BRIDGE OVER TROUBLED WATER. IPR AND COPYRIGHT MANAGEMENT IN DIGITAL HERITAGE PROJECTS. THE ARCHAIDE EXPERIENCE

Author(s): Gattiglia, Gabriele - Anichini, Francesca (University of Pisa)

Presentation Format: Oral

In this paper, we describe the IPR Management strategy developed by the ArchAIDE project and the general issues related to the use of copyright material in Digital Heritage projects. The ArchAIDE project is a Horizon 2020 project that has the main goal to digitally support archaeologists in recognising and classifying pottery sherds during excavation and post-excavation analysis. This allows them to reduce time and costs of delivering an accurate and quick classification of archaeological pottery artefacts. As in many Digital Heritage projects, the correct management of the material which falls under copyright or database protection is fundamental for the implementation of the project itself. Therefore, special attention has been given with regard to open licensing, intellectual property rights and exploitation, due to the fact that the comparative data necessary to the implementation of the ArchAIDE database and app have been derived from a variety of sources, each with different advantages and restrictions. From this point of view, ArchAIDE provides an important proof of concept by showing the potential of digitising paper catalogues in a way that demonstrates how their content can be actively re-used, and has allowed ArchAIDE to open a discussion with publishers and other data providers around the importance of making their resources available in new ways with a concrete example (seeing their data in use within the app), furthering the long-term discourse around making research data open and accessible.

11 WHERE CREDIT IS DUE: CITING DIGITAL RESOURCES IN COLLABORATIVE PROJECTS

Author(s): Kansa, Sarah (Open Context)

Presentation Format: Oral

Increasingly, archaeologists are sharing the results of their research in both conventional publishing venues and digital formats. Approaches for disseminating digital content vary widely, from institutional archives to custom-built web sites. Citation expectations similarly vary widely across digital resources. This paper uses examples of open access data published with Open Context to discuss how online dissemination raises issues that can challenge normative citation practices and offer new opportunities for broadening and diversifying how we recognize and credit the contributions of our colleagues. Open Context's high level of granularity and use of persistent identifiers in the publication of projects that sometimes involve large and multidisciplinary teams, offers important examples of how researchers reference and can reference digital resources in more conventional publications. This paper will discuss ethical considerations involved in legacy projects where participants had no expectation that their field observations would be made public. In recognition of these challenges, we will offer recommendations on licensing and attribution practices to guide expectations and citation practices for current field projects.

A. FROM PAPER TO DIGITAL FIELD DOCUMENTATION

Author(s): Kucharik, Milan (Labrys o.p.s.) - Sabol, Martin (Archeospace)

Presentation Format: Poster

Institute Labrys, o.p.s. was founded in 2007 and it primarily focuses on rescue archaeological excavations. From the beginning we are striving for a gradual transition from paper to digital documentation used in field excavations. We have tried a number of workflows and technologies in field documentation over the past 12 years. Some of them have worked well, some of them required gradual modifications, and another have been rejected.

Currently the most important tasks for our research are: intersectional photogrammetry, geodetic measurement using the GNSS technology, and online database of stratigraphic units, including records of research documentation units (tranches, sections etc.).

The main requirements for digital technology in archaeological excavation are: easy and efficient data collection, spatial identification, clarity and unity of rules and data formats above all. The goal of this documentation workflow is possibility of easy sharing of data while processing and evaluating. And of course cost savings during field works and data postprocessing. The big advantage is, that data do not have to be transcribed and also there works automatic duplicate control above all.

While this is a very tempting technological progress, we are facing a number of obstacles such as unwillingness to accept new technologies. And there are also many various non-standard technologies and data formats used by individual archaeological companies. And last but not least the problem is also the willingness of workers to learn to new workflows.

We are currently testing "ArcheoPteryx" information system, which is used for online data collection in the field during our large scale rescue excavation with using tablets, GNSS kit and also photography and photogrammetry sets.

B. DEVELOPMENT OF A UNIFIED DATABASE OF ANCIENT POTTERY FRAGMENTS

Author(s): Makino, Kumi (Kamakura Women's University)

Presentation Format: Poster

This study focuses on the elaboration of a unified database for pottery sherds found in archaeological sites in Palestine. The author originated the basic concept for use with the Hellenistic materials discovered at the ancient site of Ein Gev on the eastern shore of the Sea of Galilee in Israel, then revised it recently to detail the typology of lids in the Hellenistic and Roman periods (Makino 2015, 2017, 2018).

Known as POTSH1, this is a relational database holding images of the pottery fragments as well as verbal information. A user can compare sherds without having to go through cumbersome excavation reports from the various digs. Side-by-side images of pottery fragments along with the relevant data from several sites lead to new insights towards the interpretation of the fragments.

The author's recent studies on lids are good examples of the validity of this database. Lids are among the most frequent finds; however, they are sometimes shaped like vessels and are therefore difficult to identify. The database makes it easier to compare the different types of fragments from different sites, so that we can analyse them with a broader perspective. Changes in chronology and types, of course, are also more readily analysed by this database.

This database currently runs on ready-made software (FileMaker Pro, FileMaker International) and is used in a very limited setting: the archaeology of ancient Palestine, especially in the Hellenistic and Roman periods, characterized by acculturation of foreign styles. We need a broader analysis of pottery fragments, not only in Israel or Palestine but also in areas such as southern Europe, as one of the regions of Jewish diaspora. I hope that further studies will extend the unified database for use on a broader range of mutual research.

324 POLITICS OF HERITAGE AND NEW AUTHORITARIANISMS

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Gomes Coelho, Rui (Rutgers University) - Iacono, Francesco (University of Bologna)

Format: Round table

In recent years, Europe has been going through significant social changes that simultaneously affect and are the result of struggles about memory and political identity. Whereas post-WW2 peace was founded on an anti-fascist consensus, the fall of the Berlin Wall and the vanishing of the former Eastern bloc shifted European political consensus towards capitalist-oriented liberal democracy. This shift was crucial for the political and institutional rearrangements that took place during the integration of former socialist countries within the European Union, and for North-South relations across the Mediterranean basin. However, both the anti-fascist and liberal consensus were rooted in the emancipatory politics inherited from the Enlightenment. Since 2010, the continent has been witnessing the rise of new forms of authoritarianism built on reactionary politics. These new authoritarianisms reject the emancipatory program of liberal democracy, while still relying on its electoral mechanisms and market economy for social legitimacy. Recent consequences of this reactionary shift include a humanitarian crisis at its borders and the return of colonial nostalgia, as well as the reshaping of nationalist movements across Europe. In this session we ask: How are these transformations affecting the understanding and management of cultural heritage? What is impact of the practice of archaeology, preservation studies and other disciplines on new authoritarianisms? Are archaeologists and cultural heritage experts contributing to generate a rhetoric of "crisis"? How can we intervene in the present context?

325 CHALLENGING CHANGE: PRACTICAL STRATEGIES FOR HORIZONTAL AND VERTICAL COLLABORATION TO COMBAT CLIMATE CHANGE IN THE HISTORIC ENVIRONMENT

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Corns, Anthony (The Discovery Programme; CHERISH) - Dawson, Tom (University of St Andrews; SCAPE) - Marshall, Sinead (CITIZAN; MOLA)

Format: Regular session

Climate change impacts including: rising sea levels, more rainfall and increases in storm intensity and frequency, are creating challenges for the historic environment. With rates of change set to accelerate in the future, the time to act on these current and future threats is one of the most pressing challenges for the archaeological and wider community. To successfully understand and adapt to these threats, a truly cross disciplinary and integrated horizontal approach is required bringing together researchers from archaeology, geography, remote sensing, oceanography, history, planning and other domains. In addition, to effectively resolve these issues researchers must ensure that the full range of vertical societal actors are included in meaningful cooperation: from the macro level of government policy development to the active citizen scientist.

This session invites papers which explore the range of approaches taken within current archaeology projects and heritage management strategies which are going some way to observe, understand and analyse these complex horizontal and vertical issues with the aim of identifying the most appropriate mitigation and adaptation strategies at the national, regional and local level.

1 OPERATIONALIZING ADAPTIVE CAPACITY FOR CULTURAL HERITAGE MANAGEMENT: AN INDICATOR BASED APPROACH

Author(s): Olukoya, Obafemi (Brandenburg Technical University)

Presentation Format: Oral

A growing body of researches have highlighted the precarious position of cultural heritage in the Mediterranean region and its vulnerability to the impacts of climate change cataclysm. However, despite the rising awareness and robustness of scientific evidences, appraisal of the body of literature demonstrates that most works have been accomplished through the application of computer based modelling and a reductive array of technical top-down vulnerability assessment indicators which ignores participatory dimension of heritage management.

Given the substantive research lacuna, this present study is driven on the implicit assumption that the tangible-intangible characterization of cultural heritage rejects assessment approaches which are solely dependent on predetermined array of technical and non-participatory methodologies. Therefore, by drawing on a value-based heritage conservation paradigm this paper puts forward the following main question; how can the adaptive capacity of cultural heritage and its associative cultural significance be strengthened in the context of climate change associated impacts?. To operationalize question, a deductive approach was taken via a detailed site based case study findings.

Thus, given the socio-cultural context of the case study - Louroujina village, Cyprus - this study suggests two social categories and ten sets of indicators for the adaptive capacity of cultural heritage in events of climate change impacts. To operationalize the suggested indicators, this study assigns values to them through the application of Delphi technique and analytical hierarchy processing (AHP) methods which targets three main actors: the State of the one hand (the municipality and the Department of Antiquity), community members and the academic researchers on the other hand. To this end, this research posits a participatory procedure that can be easily replicated in a variety of local contexts for the operationalization of cultural heritage adaptive capacity in event of climate change impacts.

2 LIVING WITH CHANGE: AN ECHO FROM THE OUTER HEBRIDES

Author(s): Dawson, Tom (University of St Andrews; The SCAPE Trust) - Hambly, Joanna - Graham, Elinor (The SCAPE Trust; University of St Andrews)

Presentation Format: Oral

The long, sandy western coast of the Outer Hebrides is home to thousands of remarkable archaeological sites. Many are remarkably well-preserved, having been buried under metres of wind-blown sand and thus protected from stone-robbers and exposure to the elements. However, this shoreline is exposed to the full brunt of Atlantic storms; and when the raging sea hits the dunes and delicate machair, the change can be devastating. Tens of metres of land can be lost at a time, with the sea sucking away the sand and the archaeological layers contained within. Although climate change predictions suggest that this is a problem that will worsen in the future, the effects are already being seen, with damage on a huge scale being done to heritage sites. With reference to some of the archaeological work done in response to the threat posed to heritage by nature, this talk will explore what members of the Hebridean community think of these changes, something that they have lived with all their lives. The talk will include a film featuring interviews with local residents against a backdrop of the stunning scenery. They will discuss how the coast has changed in the past, and what they expect for the future.

3 CHERISH (CLIMATE, HERITAGE AND ENVIRONMENTS OF REEFS, ISLANDS AND HEADLANDS): MID PROJECT REVIEW

Author(s): Corns, Anthony - Shaw, Robert - Henry, Sandra - Pollard, Edward - Shine, Linda (The Discovery Programme/CHERISH) - Driver, Toby - Barker, Louise - Hunt, Daniel (RCAHMW/CHERISH) - Davies, Sarah (Aberystwyth University/CHERISH) - Craven, Kieran (Geological Survey Ireland/CHERISH)

Presentation Format: Oral

CHERISH (Climate, Heritage and Environments of Reefs, Islands and Headlands) is a five-year Ireland-Wales project, bringing together four partners across two nations: the Royal Commission on the Ancient and Historical Monuments of Wales; the Discovery Programme, Ireland; Aberystwyth University: Department of Geography and Earth Sciences; and Geological Survey Ireland. It began in January 2017 and will run until December 2021; it will receive €4.1 million of EU funds through the Ireland Wales Co-operation Programme 2014-2020.

The project collaborates with agencies, stakeholders, landowners and local groups to identify our joint-nation working areas. These have been selected on the basis of knowledge and data gaps (particularly islands and remote headlands), priority areas of erosion risk or where there is potential to collaborate on survey work.

The project is currently at the half way stage of its five year funding programme. This paper will summarize the outputs and accomplishments of the project to date, including:

- Completion of the first stage baseline recording and vulnerability assessment of the archaeological indicator sites

- Integration of multi temporal and multi modal recording strategies in the monitoring of the historic environment
- Research and development or rapid remote sensing methodologies to identify the full archaeological extent of monuments and the historic environment at risk from climate change
- Development of outreach and community engagement activities to develop a lasting legacy once the project ends
- Exploration of indicator wreck survey methodologies and preliminary results.
- Integration of research results within Government strategies and policy.
- The archiving and promotion of project data for wider use and long term monitoring.

4 CULTURAL HERITAGE MANAGEMENT IN ARCTIC REGIONS IN A CHANGING CLIMATE

Author(s): Flyen, Anne-Cathrine (NIKU - Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

The purpose of this paper is to address future challenges in managing cultural heritage in Arctic regions in a changing climate.

Since the early 1990s, the Svalbard archipelago is facing increasing pressure from mining activities, a booming tourism sector, changing climate, and expanding efforts in science and education. During 2014 and 2015 the mining activities have slowed down, but still increasing human activity, last chance tourism, and climate changes creates new environmental challenges. Unsustainable fisheries and potential oil and gas exploitation in the Barents Sea give reason for additional concern. Under the terms of the Svalbard Treaty Norway is responsible for managing the archipelago. This obligation has been amplified and repeated through various international conventions and agreements, such as the UNESCO Convention concerning the protection of the world's cultural and natural heritage. The Norwegian government has set the goal that Svalbard should be one of the best-managed wilderness areas in the world – including historic remains in the definition of wilderness.

The Svalbard archipelago houses more than two thousand historic sites. Most of them situated close to the shoreline, heavily influenced by several kinds of geothreats, whereas coastal erosion is one of them.

To implement an integrated and comprehensive approach to meet the challenge of managing the effects of climate change this paper assess future challenges and discuss the sustainability in today's management of Svalbard's historical remains. This is done by means of interviews, archive studies and field work. The results indicates that there is a substantial need to develop methods that will allow the documentation of natural hazard risk for cultural heritage to be quantified and to be met by sustainable management. Potential management actions are discussed in the paper.

5 THE RAMIFICATIONS OF A CHANGING CLIMATE: MEETING THE CHALLENGES FOR CULTURAL HERITAGE CONSERVATION

Author(s): Fleming, Arlene (The World Bank)

Presentation Format: Oral

Understanding and adapting to climatic change requires considering a broad range of effects. Phenomena such as altered ocean composition and coastline configuration, drought and precipitation patterns, among other environmental disruptions, stimulate significant additional alterations and challenges. As already evident, the ramifications of climate change include population migration on local, regional and international scale, conflict stimulated by scarce natural and financial resources, as well as erosion of governmental stability and authority. What are the implications for archaeology and cultural heritage management? How should we respond given the rapidity and severity of the threats we now perceive? Where do we find examples of actions to augment and conserve evidence of the past under such circumstances? Considering this broader context should provide further insight into threats and challenges while suggesting more effective means of protecting archaeological material and cultural heritage in general both in the present and the future. Several exemplary projects and activities point the way, as they illustrate how vastly underutilized resources - human and technological - can be enlisted. Meeting the challenges ahead may require adjusting deep-seated attitudes and conventions held by cultural heritage professionals.

6 BEYOND THE PROJECT: LONG-TERM ENGAGEMENT OF INDIGENOUS GROUPS/COMMUNITIES TO EFFECTIVELY MANAGE THE BIO-PHYSICAL, CULTURAL AND SOCIAL ENVIRONMENT AMIDST CLIMATE CHANGE

Author(s): Douglas, Diane (Applied EarthWorks)

Presentation Format: Oral

Providing indigenous groups with opportunities to manage their traditional lands and resources can increase their resilience to climate change. For several generations, many indigenous populations were forcibly relocated, had their cultural identity stripped away, and made to adopt new land management practices. These changes often resulted in landscapes and natural resources more depleted than under traditional land use practices. The vast changes these groups were forced to adopt often led to social-psychological stress, conflict, and forced migration.

In recent decades, the United Nations (UN) and International Financial Institutions (IFIs) have instituted treaties and conventions to help protect the rights of these groups. Whilst these organizations have instituted best practices to help protect these vulnerable groups (UN 2007), stakeholder engagement and consultation are often not as effective as they could be. Consultation is generally conducted in isolation, project by project and consultants are only provided a few months to develop and implement stakeholder engagement plans. The reality is, establishing relationships with community leaders (for women and men) takes

time. Questionnaires are not effective means of gathering information among these groups, and it can take years to establish adequate trust before these groups will work with scientists to identify/implement best management practices suited to their unique social/cultural landscape, as well as their natural landscape.

If UN organizations and IFIs developed a programmatic approach to consultation, wherein consultation efforts for different projects were coordinated, consultants would have adequate time to establish relationships with leaders of rural communities and indigenous groups. Consultants could then work to create regional community networks that function cooperatively to manage natural resources and the landscape in a manner that contributes resilience to climate change, sustain biodiversity, and maintain cultural identity and traditional knowledge. This paper reviews social, cultural and environmental issues faced implementing the UN REDD programme in Africa.

7 ARCHEOLOGICAL PATRIMONY OF THE COASTLAND OF NORTH OF SÃO PAULO: SUSTAINABILITY AND CREATION OF QUALITATIVE AND QUANTITATIVE INDICATORS OF VULNERABILITY

Author(s): Carvalho, Aline (Unicamp)

Presentation Format: Oral

The presentation has two central objectives: the first is to produce a brief overview about the Brazilian experiences regarding the debates on climate change and archaeological heritage; the second is to present a first theoretical and methodological proposal on the development of qualitative and quantitative indicators of vulnerability for the archaeological heritage of the coastland of the North Coast of São Paulo, Brazil. In recent years, in the specific case of Brazil, what we define historical-cultural and natural heritage has been devastated by socio-environmental disasters. We can mention: the floods in São Luiz do Paraitinga in 2010, the disasters generated by Samarco in Mariana in 2015, the fire in the National Museum in 2018, and by the Vale do Rio Doce in Brumadinho in the year 2019. So far, we hadn't faced the challenge of thinking about metrics for the vulnerability of the Brazilian archaeological heritage and resulting plans for the integrated management of this patrimony. Thereby, our proposal is to analyze the archaeological patrimony of the north coast of São Paulo as a case study that can be extended to any national scenario. The region has a significant extension of its territory delimited as an area of environmental protection, rich in biodiversity, and has been shown vulnerable to multiple urban pressures and new forms of economic exploitation. The contrasts generated by the context of risk have marked the lives of local residents and, in the same context, the very integrity of the local archaeological heritage. The proposal to participate in this Session 325. Challenging Change is linked to our need for dialogue and theoretical and methodological exchanges in the field of archaeological heritage and climate change.

8 COLLABORATION IS CORE: HISTORIC ENVIRONMENT SCOTLAND'S APPROACH TO CLIMATE CHANGE IMPACTS, RISK AND ADAPTATION

Author(s): Davies, Mairi (HES Historic Environment Scotland)

Presentation Format: Oral

As a large public body, Historic Environment Scotland (HES) has duties under the Climate Change (Scotland) Act 2009 that require it to provide leadership and act as an exemplar, by contributing to climate change mitigation and adaptation, and acting sustainably. The UK Climate Change Risk Assessment identifies 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 and Our Place in Time: the Historic Environment Strategy for Scotland, which identifies climate change as a key challenge for the sector. These obligations are reflected in our Corporate Plan (2016) and Asset Management Plan and Investment Plan (both 2018) as well as our Annual Operating Plan.

Our approach to climate change impacts, risk and adaptation of the historic environment has been shaped by working in partnership with other organisations. Our grants support external projects and programmes, including mobilizing citizen scientists to record vulnerable archaeological and historic sites. By working collaboratively, we have been able to ensure the historic environment is fully considered in pioneering projects such as Climate Ready Places, Dynamic Coast: Scotland's National Coastal Change Assessment and Edinburgh Adapts. On our own Estate, we have collaborated with the British Geological Survey and the Scottish Environment Protection Agency to collate datasets detailing current risk from natural hazards such as flooding and coastal erosion and have used these as indicators of susceptibility to climate change. This informs development, conservation and maintenance, increasing the inherent resilience of our estate to cope with the changing climate, helping to safeguard it for future generations.

9 COMMUNITIES AT THE COALFACE: SHARING PERSPECTIVES ON COASTAL LOSS

Author(s): Graham, Ellie (The SCAPE Trust; University of St Andrews) - Dawson, Tom (University of St Andrews; The SCAPE Trust) - Hambly, Joanna (The SCAPE Trust; University of St Andrews)

Presentation Format: Oral

Coastlines are often fragile and dynamic environments. They are especially vulnerable to the impacts of climate change, with rising sea levels and increasing wave height exacerbating natural coastal processes of change, loss and erosion. In many countries, they are also historically focal points of settlement and activity; consequently, concentrations of archaeological sites are particularly at risk from these threats.

In Scotland, the SCAPE Trust has built on 25 years of coastal survey to develop methods of prioritisation, assessing a site's

archaeological significance and vulnerability to coastal processes. By taking a citizen science approach to data-gathering, this work has incorporated a range of values into judgements of importance. Analysis of the results has been undertaken in partnership with heritage managers, practitioners and communities, and shared with regional and national policy-makers.

The Learning From Loss project then brought together an international team of researchers, practitioners and local stakeholders to address the global questions of how significance should be assigned to sites and priorities identified. It examined the range of criteria that can be incorporated and the perspectives that can be included when we have to make difficult decisions and accept that not everything can be saved. Different concepts and metrics of value were considered and options for potential responses discussed, from practical work at site-specific level to pragmatic strategies to mitigate the threat of loss.

This paper will explore some of these issues and examine how this collaborative work has contributed to the development of robust systems for responding to the threat posed to heritage sites by climate change.

10 UNDERWATER CULTURAL HERITAGE AT RISK: BEST PRACTICES FOR DOCUMENTING MARINE RESOURCES

Author(s): Ayers-Rigsby, Sara - Scott-Ireton, Della (Florida Public Archaeology Network) - Altmeier, Brenda (NOAA) - Corns, Anthony - Henry, Sanda (CHERISH) - Kangas, Rachael - Moates, Jeff (FPAN) - Pollard, Edward - Shaw, Robert - Shine, Linda (CHERISH)

Presentation Format: Oral

Collaboration is key in protecting underwater cultural heritage. In April of 2019, researchers from Climate Heritage & Environments of Reefs, Islands and Headlands (CHERISH) visited the Florida Keys to meet with the Florida Public Archaeology Network (FPAN), present their research, and encourage transatlantic partnership.

Underwater cultural heritage off the coast of Florida is managed by both state and federal entities. These sites provide archaeological information, serve as critical resources for biodiversity, and drive diving tourism to the area. FPAN has developed a series of workshops for recreational divers with the goals of raising awareness of underwater cultural heritage and helping communities protect these resources.

In 2018, following the successful launch of FPAN's Heritage Monitoring Scouts (HMS) Florida Program, a citizen science initiative to document at-risk terrestrial sites, FPAN conducted the first Submerged HMS program in collaboration with the National Oceanic and Atmospheric Administration (NOAA). The goal behind this partnership is to engage and train local citizen scientists to document environmental change at these sites, particularly after major events like a hurricane.

CHERISH partners across Ireland and Wales are establishing their own citizen science programme in an aid to monitoring and recording the marine historic environment. The emulation and transfer of the activities carried out by FPAN and the HMS program will be critical in the development and evolution of guidance on community marine recording. Critical evaluation of the different marine archaeology licensing regimes and how they encourage active community involvement in monitoring as well as deter human impacts to fragile resources will also be explored.

Only by integrating efforts from the federal level down through the local community, and working collaboratively with colleagues in other disciplines can professional archaeologists expand their reach and focus their efforts on sites which will be the most impacted by climate change.

11 CITIZAN'S COASTAL PERSPECTIVE: TOWARDS A BETTER UNDERSTANDING OF THE IMPACT OF CLIMATE CHANGE

Author(s): Marshall, Sinead (MOLA)

Presentation Format: Oral

Since its foundation in 2015 the CITiZAN community archaeology project's focus has been training volunteers in practical skills to assist with the mammoth task of recording and monitoring English coastal and intertidal archaeological sites, which are under threat from extreme erosion and climate change.

We present our approach for the next three-year programme, 2019 -2022, building on established networks and systems to focus on six new CITiZAN Discovery Programme areas: the Humber, Liverpool Bay, the Blackwater, the Kent coast, the Solent and Devon.

With funding from the National Lottery Heritage Fund (formerly HLF) and support from MOLA, the Council for British Archaeology and the Nautical Archaeology Society, we are further developing horizontal and vertical working relationships with a range of local, regional and national stakeholders to achieve these aims. Landowners, wardens and others with established relationships to these stretches of coast are joining the effort. Targeted professional development training from CITiZAN staff will assist these contributors to recognise and deal with threatened archaeology in their local Discovery Programme area as a vital part of the team's work.

How might such a collaborative approach help us to better understand the impact of climate change on this vulnerable archaeological resource?

MENTORING FOR ARCHAEOLOGISTS (ANNUAL ROUND TABLE OF THE EAA COMMITTEE ON THE TEACHING AND TRAINING OF ARCHAEOLOGISTS)

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Geary, Kate (Chartered Institute for Archaeologists) - Karl, Raimund (University of Vienna)

Format: Round table

Mentoring is widely recognised as a valuable tool at all stages of the professional career path, from early career specialist to future leaders and managers, and yet there seem to be very few formal mentoring schemes available to archaeologists. This year, the annual Round Table of the EAA Committee on the Teaching and Training of Archaeologists will discuss the benefits of mentoring and consider whether formal mentoring schemes could be established, identify the most appropriate organisations to deliver them and discuss how to ensure quality and avoid conflicts. We will hear from allied heritage professionals who already benefit from mentoring schemes and look at the benefits and barriers for our sector. We will also consider the potential for non-archaeological mentoring programmes to benefit our profession and whether better sign-posting of opportunities could help. We welcome contributions from archaeologists who have benefitted from formal mentoring and from professionals in allied fields where mentoring may already be well-established.

UNDERWATER ARCHAEOLOGY IN EUROPE - WHERE DO WE STAND?

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Waugh, Karen (EAA Secretary; Vestigia BV, Archeologie & Cultuurhistorie) - Eberschweiler, Beat (Kantonale Denkmalfpflege Zurich)

Format: Discussion session

Underwater archaeology is one of the most important disciplines within the framework of archaeology in general. It covers all periods and types of sites and includes not only maritime contexts but large areas both inland and along the sea coasts. Technical and methodological developments in recent decades, particularly in recent years, combined with excellent preservation conditions on sites have brought about an exponential growth in research possibilities and results. In times of climatic changes and extensive economic development effecting our coastal areas in particular, the practice of underwater archaeology has become increasingly significant in terms of cultural heritage preservation, protection and presentation.

An event such as the 25th Anniversary provides the EAA with an important opportunity to take stock: not only to reflect on past achievements but also to target areas of professional practice that are still underrepresented within the Association. The session, formally supported by the EAA Executive Board, is intended to (re)introduce underwater archaeology to the EAA agenda.

This exploratory session will assess the state of play in underwater archaeology in Europe. We would like to invite leading practitioners in this field, working within Europe or further afield, to focus on the challenges facing the discipline, for instance in formulating and enforcing national and international policy, but also the successes, and innovations within all aspects of the field of underwater cultural heritage management, ranging from long-term research or infrastructural projects and synthetic works to community participation at home or abroad. In conclusion, the session aims to propose how the EAA can provide its members with an effective platform and network to develop and promote best practice, cooperation and dissemination of research, within the field of underwater cultural heritage.

ABSTRACTS

1 INTENSIFIED FOCUS ON UNDERWATER ARCHAEOLOGY OF THE NETHERLANDS

Author(s): Speleers, Barbara - Manders, Martijn (Cultural Heritage Agency the Netherlands)

Presentation Format: Oral

The Netherlands is rich in submerged landscapes as well as reclaimed lands containing heritage of various time periods. As a seafaring nation it left its remnants also outside its borders. Traces of the Netherlands' rich maritime history can be found all over the world. They include wrecks of the many ships that belonged to the Dutch East India Company (VOC), the West India Company (WIC) and Admiralties. The Dutch State regards these shipwrecks as its property.

In the Netherlands, responsibility for the management of the cultural heritage is shared by national, regional and local government. The North Sea is outside the local and regional borders and is managed by central government. Underwater archaeology and its potential heritage still don't have the focus of local authorities. Awareness of their role in the heritage management needs to be created.

Both the North Sea and IJsselmeer will undergo changes to meet the energy agreement and anticipations on climate change. The production of energy from renewable sources has to increase considerably in the coming years. Large offshore windfarms have been planned. The knowledge on the archaeological potential of the seabed is limited and needs to increase to meet the forthcoming spatial intrusions.

The drawbacks of the system in which archaeological research is connected to spatial planning is that natural degradation is outside any bodies responsibility. Natural erosion is a concern worldwide.

Without management, there is a risk that wrecks will be lost.

The Minister of Education, Culture and Science has acknowledged the need for intensified focus on maritime heritage and underwater archaeology and has yet increased the budget for the management of it. With the programme Maritime Heritage of the Netherlands and a separate programme Maritime Heritage International we aim for a complete set of measures to protect, preserve and research our maritime past.

2 SASMAP: DEVELOPMENT OF TOOLS AND TECHNIQUES TO SURVEY, ASSESS, STABILISE, MONITOR AND PRESERVE UNDERWATER ARCHAEOLOGICAL SITES

Author(s): Gregory, David (The National Museum of Denmark)

Presentation Format: Oral

SASMAP (www.sasmap.eu) was a 3 year project (2012-2015) that took an holistic approach to locating, assessing, monitoring and safeguarding underwater cultural heritage. The project was aimed at shallow coastal sites and developed tools and technologies to allow “down-scaling” from the large scale regional level, moving on to the local site level and finally to the individual components of a site; “upscaling”. The project looked at six scientific themes to address the successful management of underwater cultural heritage:

- Geological models for regional evaluation of probability of locating archaeological sites and their preservation potential
- Development of Tools for Surveying and Monitoring Coastal and Underwater Archaeological Sites
- Assessing the burial environment and deterioration of organic materials
- Assessment of the state of preservation of waterlogged archaeological wood
- Tools and techniques to raise waterlogged organic archaeological artefacts
- In situ stabilisation of underwater archaeological sites

An overview of the results will be given and the implications of the results in terms of how such research projects could be better incorporated in marine spatial planning will be discussed.

3 MANAGEMENT OF UNDERWATER CULTURAL HERITAGE IN FLANDERS (BELGIUM)

Author(s): Vandeveld, Jessica - Pieters, Marnix - Demerre, Ine (Flanders Heritage Agency) - Van Haelst, Sven (Flanders Marine Institute)

Presentation Format: Oral

Belgium has only a limited shoreline and is therefore only responsible for a limited part of the North Sea. Nonetheless, several hundred wreck sites have been identified, dating from the 16th century to the 1970's. The seabed itself is an archeological, or rather paleo-geological feature, as it was once dry land, a fertile and inhabited prehistoric landscape of which large parts have been preserved.

Belgium has ratified the Unesco convention on underwater cultural heritage in 2013 on behalf of its different regions and communities. The country's political organization however creates a rather interesting situation. Heritage management and research, including archaeology, is a regional responsibility. But the North Sea, being of national importance and not belonging to one of the regions, is predominantly under federal jurisdiction. Including in relation to underwater cultural heritage. This means that Flemish institutions like the Flanders Heritage Agency and the Flanders Marine Institute can do research at sea, but do not have any direct means of managing underwater heritage, through legislation etc. For the federal government, archaeology is not its core business. They do however take up this responsibility, in close collaboration with the Flanders Heritage Agency and the Flanders Marine Institute.

In recent years these institutes have been involved in several international and multi-disciplinary research projects, and have invested in field surveys and in updating inventories. This has resulted in a much improved dataset, a better understanding of the geology of the seabed, but most importantly in improved legislation on the protection of known wreck sites.

In the years to come, we will continue our research and our efforts to improve the management of maritime cultural heritage, both at sea, along the shoreline and in and along our rivers.

4 THE MANAGEMENT OF INLAND WATERS ARCHAEOLOGICAL HERITAGE - THE POLISH ACHIEVEMENTS, FAILURES, CHALLENGES ...

Author(s): Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)

Presentation Format: Oral

The issues of protection of the underwater archaeological heritage are usually discussed in the context of monuments located in marine areas. However the huge scientific potential lies in inland waters. The protection of the underwater heritage depends on the legal status of the waters. In the case of inland waters, it's regulated by the national laws.

The underwater cultural heritage due to its specificity and difficult access is a field of interest for quite a small group of scientists. Meanwhile, the underwater relics of ports, bridges, settlements, etc. complement the history resulting from archaeological research conducted on land. It's important to accurately identify these resources and provide them with effective protection.

The threats to underwater heritage result from both environmental and human factors - the water pollution, the eutrophication of lakes, intensive inland waterway transport, dredging of rivers and water reservoirs, water level fluctuations, developing tour-

ism and intensification investments in the coastal zone of lakes, divers activity, water sports, etc. These threats seem to be more intense in inland waters - the underwater relics are located at a small depth or on the surface of bottom sediments, thus being more exposed to unfavorable conditions. One of the threats is an illegal prospection. The attractiveness of underwater sites, based on well-preserved metal artefacts, makes them the subject of growing interest of all kinds of prospectors - not only seekers penetrating with a metal detector, but also robbers using neodymium magnets.

Recognition and registration of underwater archaeological sites, evaluation scientific and historical value determines ways of its management. The protection in situ of underwater relics should be associated with limitation of activities in the area of the archaeological site. The essential for effective protection is education, the involvement of local authorities and the awareness of the local community.

5 YOU DON'T KNOW WHAT YOU'VE GOT TILL IT'S GONE: PRESERVATION AND DETERIORATION OF HISTORIC SHIPWRECKS

Author(s): Gregory, David (The National Museum of Denmark) - Quinn, Rory (University of Ulster) - Matthiesen, Henning (The National Museum of Denmark) - Dam, Mogens - Normann, Gert (Sea War Museum Jutland)

Presentation Format: Oral

UNESCO estimate that there are over three million shipwrecks lying on the bottom of the world's seas and oceans. International (UNESCO, 2001; ICOMOS, 1996) and European (Valletta, 1992) legislation all advocate that underwater cultural heritage should, where possible, be protected in situ. However, such legislation cannot protect underwater cultural heritage from the potential ravages of nature. Since their time of sinking, shipwrecks will be exposed to a multitude of physical, chemical and biological processes, as well as cultural impacts that will affect their preservation. It is thus essential to be able to assess the effect the natural environment has had and will have on shipwrecks in the future should they be preserved in situ. This paper will present an ongoing project to investigate the preservation of wrecks in the North sea. The project draws on an unprecedented multibeam echosounder dataset of over 400 wrecks. The ultimate goal of the project is to correlate the observed seabed distribution of these wrecks with natural and cultural formation processes in a GIS platform in order to better understand the deterioration of shipwrecks and facilitate the future preservation and management of this resource.

6 UNDERWATER ARCHAEOLOGY IN ESTONIA - WHERE DO WE STAND?

Author(s): Roio, Maili (National Heritage Board of Estonia)

Presentation Format: Oral

After the restoration of Estonian independence in 1991, the work with reorganising the legislation and protection of cultural heritage was started. There were practically no underwater archaeological surveys carried out, there were only three underwater monuments that were placed under state protection and the so called opening of the sea meant that the known wrecks suffered a wave of looting.

It was only in 2011, when the Heritage Conservation Act enabled to expand specific protection to underwater heritage and the links with other relevant legal acts began to form about the same time. The change of attitude among the general public has moved hand in hand with the regulations. The development of underwater archaeology as a discipline in the last couple of decades has helped balance the backlog from the rest of Europe that was evident in the 1990s.

A major emphasis in underwater archaeological surveys is placed on non-destructive methods and inventory of antiquities, which due to the development of 3D softwares has remarkably shortened the time it takes to carry out fieldwork. The topical issues next to heritage management and maritime spatial planning are, for example, the 20th century wrecks that pose an environmental threat - their inventory and evaluation of risks; establishment of underwater wreck parks which aim to facilitate accessibility, but also to ensure sustainable management of the sites; depositing large underwater finds (mostly shipwrecks) that cannot be preserved in their original location etc. In the presentation I will introduce the main directions in the management of underwater heritage and the results of major processes.

7 UNDERWATER ARCHAEOLOGICAL INVESTIGATIONS OF SUBMERGED PILE-DWELLINGS OF THE 4TH-3RD MILL BC IN THE WESTERN DVINA RIVER BASIN (NW RUSSIA)

Author(s): Dolbunova, Ekaterina (The State Hermitage Museum; The British museum) - Mazurkevich, Andrey - Vasilieva, Natalia (The State Hermitage Museum)

Presentation Format: Oral

Underwater investigations of the Stone Age sites located in NW Russia were started in the 1980s by the North-Western archaeological expedition of the State Hermitage Museum. This long-term research remains the only one exploring submerged Stone Age sites in Russia. Methods of excavation and conservation have been developed and approved through long term researches. Underwater excavations were conducted mainly on Serteya II site, located on the Serteyka River, the left-tributary of the Western Dvina River, and groups of sites Dubokray located in the lake Sennitsa. On the site Serteya II several dwellings were excavated thoroughly, which revealed an impressive archive of ecofacts and artefacts survived. Remote sensing methods applied allowed uncovering new types of sites not known before. Underwater researches were applied for different conditions - sites located within zero and low visibility milieu, close and remote from the shore, with the variety of constructions and artefacts to be recorded and conserved. Long-term conservation of finds led to establishing and verifications of different methods of field and

museum conservation. Also anthropogenic and natural influences were detected that led to the destruction of some of the sites that raise the question of possible manners for preservation and recording of such types of the sites.

8 CORNUCOPIA OR LOST OPPORTUNITIES? RECORDING AND CHARACTERISATION OF SUBMERGED STONE AGE SITES IN DENMARK

Author(s): Uldum, Otto (Langelands Museum)

Presentation Format: Oral

The sheltered Danish waters are known as the worlds' most abundant fossil Stone Age land-scapes, with the greatest number of submerged Mesolithic sites in any country. This is due both to geomorphologic reasons as well as an early effort to record all archaeological sites in Denmark. The sites chosen for excavation were the most abundant in terms of artefacts present, this being due to the soft sediments accumulated immediately after inundation. Not surprisingly the excavators chose to hone their new skills by returning to the same sites year after year, in this way getting familiar with the environment and recording methods. But after the initial projects ended the much-acclaimed new field waned, and not many new sites were excavated to any greater extent.

Public interest in the new kind of sites on the sea bed was great, and many new sites were reported to the museums, in turn making their way into the central Sites & Monuments database, but they were taken at face value, and no scrutiny done before entering into the records. In this way the many hundreds of submerged Stone Age sites each represented by a dot on the map are unevenly categorised to the point of uselessness.

During the 1980's a model for locating submerged sites on the basis of underwater topography was developed and has since proved very efficient. There are however reasons to criticise the uniform use of this model, and suggestions to renewed reconnaissance are put forward. The treasure trove Danish archaeology has been keen to advertise, is primarily based on less than a handful of sites, and the true value of it is not well known.

9 UNDERWATER HERITAGE IN COLOMBIA: THE SAN JOSÉ GALLEON AFFAIR

Author(s): Piazzini, Carlo (Universidad de Antioquia; University Network of Underwater Cultural Heritage)

Presentation Format: Oral

The previous government of Colombia announced in 2015 the discovery of archaeological remains that could correspond to the Galleon San José, a royal ship of the Fleet of the Indies sunk in battle in the Caribbean Sea in 1708. The discovery was made in the context of a project hired with a private company. This contract allows the company to extract and commercialize the cargo of the Galleon that rises a huge economic value. As this presentation will explain, this action puts at risk the underwater cultural heritage and goes against the policies that the Colombian State has been developing for decades for the protection of archaeological heritage. Amid criticism and pressure from different national and international sectors, the current government has temporarily suspended the extraction process, delaying a decision that would have a high impact on the preservation of the underwater cultural heritage, and on the development and implementation of national and international policies devoted to its protection.

335 '... IN WITH THE NEW!' UP AND COMING ARCHAEOLOGICAL RESEARCH IN MEDIEVAL EUROPE IN 2019

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Busset, Anouk (University of Glasgow; Université de Lausanne) - Heinonen, Tuuli (University of Helsinki)

Format: Session with presentation of 6 slides in 6 minutes

For the second year now, postgraduate students and early career researchers whose interest focuses on Medieval Europe will have the opportunity to present their ongoing research during this session proposed by MERC. It offers a platform for speakers not only to present upcoming projects, but also connect with a wider community of early career researchers. This session will offer opportunities to discuss new and promising research avenues that will shape tomorrow's medieval archaeology, through short and dynamic talks of six minutes. At the same time, we want to create a space for opening up stimulating discussion, and spark possible ideas for future collaborations. The presentation of experimental or unprecedented work is also explicitly encouraged. We welcome papers tackling a wide variety of currently pressing as well as innovative themes, crucial concerns for the field, potential of new technologies, unexplored avenues, and new work on old subjects/materials. We aim to bring together a diverse group of early career scholars, therefore participants from all geographical backgrounds are encouraged to submit a proposal.

ABSTRACTS

1 ARCHAEOLOGICAL RESEARCH OF MEDIEVAL WATER MILLS IN CZECHIA AND POLAND AS A CONTRIBUTION TO ARCHAEOLOGICAL RESEARCH OF MILLS IN EUROPE

Author(s): Walkowski, Szymon (Jagiellonian University in Kraków, Institute of Archaeology)

Presentation Format: Oral

Water mills in Czechia and Poland start to begin in the XII century. The process of increasing the number of water mills and their development is well reflected in historical documents, but there are still small number of examples of archaeologically researched mills in both country. This study presents the state of archaeological research of medieval water mills in Czechia and Poland and the result of comparative analysis of them. The analysis is based on the archaeological research of sixteen sites: ten of them are located in Czechia, six in Poland. The following elements from this sample have been analyzed: mill structure with its construction, functions, environmental changes and artifacts found on the archaeological sites.

The result of comparative analysis shows the mill as a complex of buildings for different purposes connected to the environment that has been changed for milling aims. The examination of artifacts shows the additional tasks in which the miller took part. The results suggest that future archaeological research can provide new data on such milling aspects.

The purpose of this brief communication is also to discuss the new information on medieval water milling that can be obtained thanks to the archaeological excavation. It's also a contribution to future archaeological research of medieval water mills in Europe.

2 APPROACHING HIGH AND LATE MEDIEVAL URBAN ELITES – A JIGSAW OF DIFFERENT BOXES

Author(s): Radohs, Luisa (Aarhus University)

Presentation Format: Oral

The present paper provides an overview of my PhD project on urban elites in the southwestern Baltic (12th to 14th centuries). Heart of my research forms the question of a social differentiation in towns. Urban deposits with their thick cultural layers and complex stratigraphy allow us unique insights into the living situation, the everyday life and the social practices of the urban inhabitants through time. However, due to the nature of the archaeological record and the palimpsest-like character of towns, many difficulties are connected to a social classification of townspeople. Here, questions of precise dating of structures, the diachronic development of urban plots together with the assignment of archaeological material to specific locations and inhabitants as well as the general question of quantity, quality and the value of material culture must be named. In this regard, a source-critical approach as well as a holistic and deliberate use of different sort of sources is indispensable.

With my presentation, I will introduce my PhD project on medieval elite groups in North German and Danish towns, highlight key challenges in my research and present some of my ideas how to approach urban leading groups in order to grasp more of their specific character. The presentation would like to encourage a subsequent discussion on the potential, but also limitations of the archaeological and historical record for questions regarding social conditions in high and late medieval times.

3 REVEALING THE LATE MEDIEVAL HARBOUR OF OSLO, NORWAY

Author(s): Havard, Hegdal (NIKU - Norwegian Institute for Cultural Heritage Research) - Wammer, Elling (NMM - The Norwegian Maritime Museum) - Engen, Trond (NIKU - Norwegian Institute for Cultural Heritage Research) - Grue, Marja-Liisa Petrelius (NMM - The Norwegian Maritime Museum)

Presentation Format: Oral

We present preliminary results from an ongoing, large-scale excavation in the medieval harbour of Oslo. We will document the progression of the harbour front over an estimated period of about 200 years, with associated finds of vessels and shipwrecks. Continuous development of the harbour was forced by isostatic land rise, gradually lifting older elements towards shallower water and eventually onto dry land. The mainly horizontal expansion process creates a unique opportunity for archaeological excavation, and makes the harbour an important proxy for the development of the medieval city itself.

Earlier findings indicate that the time span covered will be mainly late medieval. This will present an opportunity to study the period in the wake of the Black Death, and hopefully gain new insights into the extent and recovery process of the disaster. Changes in marine technology will likely also be evident, since preliminary investigations indicate the presence of several shipwrecks. The material culture of the late medieval period is likewise rarely preserved in Oslo, but marine deposits in this area often present very good conditions for preservation.

The excavation will be conducted during summer/autumn 2019, and cover a substantial proportion of the sea front from ca AD 1350 and up until the 17th century. The results will be processed as 3D models and the excavated areas will be composited continuously as the excavation proceeds. The excavation aims to utilise new methods both for scientific results and public outreach.

- 4** **BUCKLES, BROOCHES, BUTTONS... AND THE SOCIAL LIFE IN MEDIEVAL TOWNS OF CENTRAL EUROPE**
Author(s): Sawicki, Jakub (Institute of Archaeology of the Czech Academy of Sciences, Prague)
Presentation Format: Oral
- Buckles, brooches, buttons... in other words dress accessories - are the best preserved archaeological relics of fashion, and thus constitute one of the better sources for research on luxury or social status.
- Dress accessories have been on the margins of scholarly interests of archaeologists for a long time, but in recent years we have been observing, the so-called material turn, ie a shift towards studying broadly understood material culture, where the emphasis is on issues such as assemblages, non-human agency, social status, identity or commodification and consumption of objects. In addition, we also observe an increased inflow of sources caused by publishing by the so-called 'detectorists' (amateur seekers using metal detectors) of their finds in various internet databases, the largest and oldest of which is managed by the British Museum Portable Antiquity Scheme (finds.org).
- The aim of this presentation is to discuss currently running project related to the broadly understood consumption of dress accessories and their usefulness in social communication processes based on archaeological finds from Central Europe at the broad European comparative background.
- 5** **FROM MEANEY TO MEANING: A NOVEL APPROACH TO UNDERSTANDING EARLY MEDIEVAL MORTUARY OBJECTS**
Author(s): Górkiewicz Downer, Abigail (University of Chester)
Presentation Format: Oral
- Although amuletic interpretations were a feature of antiquarian interpretations of burial offerings, they have continued to feature in early medieval British burial reports. Likewise, French- and German-language scholarship has also continued to categorise certain objects as 'amuletic' based on their ascribed attractiveness, material composition, non-function, symbolism, portability, and antiquity. These long-standing interpretations of mortuary objects have little to do with early medieval amulets and limit our comprehension of early medieval funerary practices.
- This new approach, inspired by assemblage theory and previous early medieval mortuary spatial research, offers a different understanding of the mortuary context in early medieval Western Europe. Utilising material from Kent, East Anglia, and Alsace, my research interprets all objects within inhumations not as static entities but as entities with dynamic and fluid identities and meanings that change with time to suit specific needs in different locations. This approach stresses that mortuary objects' identities are formed through immediate and distant relations and must be understood within their spatial positioning, associated burial structures, the accompanying corpse, and pathology.
- 6** **DIGITAL PHOTOGRAPHY AND OBJECT CHEMISTRY IN MEDIEVAL ARCHAEOLOGY**
Author(s): Christie, Heather (Glasgow School of Art)
Presentation Format: Oral
- Archaeological digital photography, particularly that relating to objects, is often employed for largely documentary purposes. While this type of photography is extremely valuable in archaeology, our tendency to focus largely or entirely on documentary photography limits the information we gain from archaeological photographs. My PhD research has found that a standard dSLR camera converted for full-spectrum photography (300 - 1000nm) can identify chemical relationships between objects by comparing their differential reactions to near ultraviolet (300 - 400nm) and near infrared light (950 - 1000nm). In applying this technique to glass objects, I have identified chemical differences between naturally-coloured Medieval glass from Scottish, Anglo-Saxon and medieval English contexts that suggest either differences in glass recycling or in the manufacture or origin of the glass itself. While comparison of object chemistry can be done through chemical analysis or multispectral or hyperspectral imaging, the cost of such studies is often prohibitively expensive for many archaeological projects. The type of spectral photography employed here is more affordable and is an entirely non-contact and non-destructive method for determining relative chemical data between objects. Spectral photography with a dSLR therefore serves as a valuable new technique for understanding manufacture and trade of archaeological objects through comparison of their relative chemical data, and it has much to offer in the study of Medieval artefacts.
- 7** **GROOVY GOVAN: DIGITAL IMAGING IN THE ANALYSIS OF EARLY MEDIEVAL CARVED STONES**
Author(s): Kasten, Megan (University of Glasgow)
Presentation Format: Oral
- Pursuant to the author's contribution to '...In with the New!' last year, the results from the research applications of digital imaging to the early medieval carved stones from Govan in Glasgow, Scotland, will be summarized. The recovery of worn patterns via digital imaging techniques has led to the identification of several themes of standardization in the design of the understudied recumbent cross-slabs. During one of these phases, proportionally identical crosses were replicated at different scales on pairs of cross-slabs. Each of these pairs shares similar interlace patterns, so it was thought that a single carver may have created each pair. To test this, Groove Analysis was applied to the 3D models of two of the paired stones. Groove Analysis is a statistical approach developed by Laila Kitzler Áhfeldt that measures and quantifies the cross-section and rhythm of a carved groove with

ten variables; these can then be used to identify individual carving styles through multivariate statistics. The results indicate that, while the two stones share several traits in terms of ornament and cross-shape, they were most likely carved by different sculptors. This presentation will conclude with a discussion of these results in the context of the 'Govan School of carving'.

8 ESTABLISHING BOUNDARIES: THE EARLY-MEDIEVAL ANGLO-WELSH BORDERLAND

Author(s): Delaney, Liam (University of Chester)

Presentation Format: Oral

The establishment of physical borders and frontier control mechanisms have become an unfortunately apt topic in the public sphere in the 21st century. Consequently, archaeological contributions to this topic have increasing relevance to the complex and changing significance of borderlands and their formation. When studying early medieval Britain, border-works can be seen as the dykes and linear earthworks that emerge across the landscape. Offa's Dyke stands out as not just the largest, but the most well-known of these earthworks; although conversely, it is generally rather poorly understood, with questions raised over its intrinsic attributes of extent, location and purpose.

This paper aims to introduce research done in the first year of PhD study into the landscape of Offa's Dyke; utilising digital heritage tools and data sources to examine and re-evaluate evidence of the nature of the dyke and the wider Mercian frontier. A digital approach can shed light upon the extent and existence of Offa's Dyke, but also the affect that borders have on landscapes, and the people living in the shadow of them.

9 SHAPING THE SACRED: THE TRANSFORMATION OF SACRED PLACE IN EARLY MEDIEVAL NORTH-WESTERN EUROPE

Author(s): Busset, Anouk (University of Glasgow)

Presentation Format: Oral

This paper will discuss the first steps of a postdoctoral project which explores new approaches to the transformation of sacred space in early medieval north-western Europe. This project explores the natural physical definition and development of sacred places in north-western Europe between the 5th and the 12th centuries AD. This broad chronology encompasses the main three stages of conversion to Christianity (mission, diffusion and institutionalisation). A comparative approach drawing on case studies from Brittany, Scotland, Ireland and Scandinavia provides new understandings of the structure and agency of sacred space in this key period. By bringing together data from a wide geographical spectrum throughout north-western Europe, the project presented here examines the process of ineclesiamento at a large scale, in area that were engaged in the process of Christianisation at diverse time periods, during varied lengths of time, to delineate a nuanced and inclusive narrative of the Christianisation process from a spatial point of view.

A. THE GENETIC BACKGROUND OF 13 SCOTTISH SOLDIERS FROM PALACE GREEN LIBRARY: A MITOCHONDRIAL DNA STUDY

Author(s): Saari, Nelli-Johanna (University of Helsinki; Durham University) - Fernández-Domínguez, Eva - Gerrard, Chris - Millard, Andrew - Caffell, Anwen (Durham University)

Presentation Format: Poster

The discovery of two mass graves in Palace Green Library in Durham, UK (2013), led to comprehensive investigations to identify the buried individuals. It was proposed that the individuals could represent the Scottish soldier prisoners from the Battle of Dunbar in 1650. Multidisciplinary research of the remains supported the hypothesis. Based on an isotope analysis a likely Scottish, English or migrated origin was proposed for the 13 individuals tested. A preliminary research suggested a good biomolecular preservation level for one individual, but the overall biomolecular preservation was not known.

This study revisited the Scottish Soldier research material to investigate the preservation of endogenous mitochondrial DNA of the previously studied 13 individuals. The mitochondrial ancestry and possible geographical origin in relation to the previous isotope results could be assessed based on DNA analyses. The results included successfully extracted mitochondrial DNA for all 13 sampled individuals. The mitochondrial haplogroup data obtained indicated a western European ancestry and the statistical analyses showed a continuous pattern of genetic similarity between the individuals and Scotland or England. The lower discrimination level of mitochondrial DNA in the European context and the shortness of the targeted region complicated the analysis of the geographical origin, but it could be concluded that some individuals displayed Scottish rather than English origin. The promising results indicated that further ancient DNA analyses could be completed with the material, for example emphasising Y-chromosome research.

336 REACHES OF EMPIRE: HISTORICAL ARCHAEOLOGY AND NEW - GLOBAL - INSIGHTS INTO EUROPEAN EXPANSION

Theme: Global change and archaeology

Organisers: Seetah, Krish (Stanford University) - Čaval, Saša (Reading Univeristy) - Haines, Julia (University of Virginia)

Format: Session with keynote presentation and discussion

Using 'Europeanization' as a framing device, this session will illustrate the increasing global reach of historical archaeology, and

the ways in which the archaeology of the more recent past can shed light on the nuances of social, economic, and ecological transformation.

Taking a broad and encompassing view of historical archaeology, it is apparent that as a sub-discipline, approach, and conceptual framework, this sub-discipline continues to flourish, tackling the complexity of working across both material and textual sources of evidence. This session requests submissions that offer one or more of the following: new insights on the archaeology of the colonial experience; innovation in methods that push the boundaries of how we study 'historical archaeology', or theoretical positions that offer fertile ground for debate.

Presentations and discussion will emphasize, though not be limited to: assessing the state-of-the-field; how new technologies as well as connections to other disciplines are contributing to the development of this sub-discipline; observing how approaches to studying historical archaeology are evolving in different parts of the world, whilst questioning how we can learn from and complement each other?

However, ultimately, with increasing challenges to contemporary populations, it is hoped that papers will centralize on one issue in particular: how can the archaeology of the recent past help us to understand, moderate, and even mitigate, the negative legacies of colonialism for people and environments?

ABSTRACTS

1 THE QUARANTINE SYSTEM: A FEATURE OF 'EUROPEANIZATION' IN THE INDIAN OCEAN

Author(s): Cianciosi, Alessandra (Ca' Foscari University of Venice)

Presentation Format: Oral

During late medieval and colonial period, the disease ecologies of entire regions were transformed due to migrations and human impact on the land, leading to large-scale debilitating epidemics. In response, European powers completely reimagined regional landscapes and seascapes adhering to how they perceived epidemic disease and its control. Quarantine, traditionally viewed as merely a mechanism for the control of disease, became increasingly recognised as a critical feature of Europeanization: the outward material response to important changes taking place socially, ecologically, and politically at the time. This practice of enforced isolation, conceptually and as a system, serves as a lens on changing views towards labour diaspora: the need to protect populations, both elite and labouring class; and on a political level the assertion of the nation-states' authority and territoriality. This paper aims to present preliminary results of the research on Flat Island (Mauritius). This quarantine station in the Indian Ocean was established by the British Empire to prevent the epidemic of cholera during the second half of the 19th century. Studied archival documents allow a reconstruction of the development and use of this station and bring new information regarding the transportation and migration routes in the 19th and the 20th century Indian Ocean World.

2 THE ARCHAEOLOGY OF INDENTURED LABOR: DOMESTIC LANDSCAPES, AND EVERYDAY LIFE ON A MAURITIAN PLANTATION

Author(s): Haines, Julia (University of Virginia)

Presentation Format: Oral

This paper focuses on migrant laborers in Mauritius, extending scholarship in comparative plantation archaeology through attention to the post-slavery period of the Indian Ocean context. As a British Colony, indentured laborers hailing primarily from India, and secondarily from China and Africa migrated to Mauritius to replace enslaved labor on sugar plantations beginning in the 1820s and '30s. Archaeological and archival fieldwork conducted at Bras d'Eau National Park, located on the N.E. coast of Mauritius, demonstrates how migrant laborers transformed the local cultural and ecological environment. Bras d'Eau was a working farm with a small enslaved population that transitioned to a sugar plantation during the first quarter of the 19th century, eventually employing hundreds of contract laborers. Despite their short five-year tenures on the plantation, archaeological remains show that indentured laborers created homes that reflected and recursively structured their worldview even within the confines of the plantation living quarter, thus challenging perceptions of the impermanence of migrant labor and migrants' unconcern with circumstances seen as momentary. Spatial analysis and material culture suggesting that in their every day lives immigrant men, women, and children expressed an engagement with Indian Ocean notions of health and environment, forming a distinctly Mauritian cultural milieu of domesticity. This project is a case study for comparative plantation archaeology and colonialism more broadly, and the growing literature on the materiality of migrant labor.

3 SOCIAL POSITIONING THROUGH RELIGIOUS NEGOTIATIONS IN COLONIAL MAURITIUS

Author(s): Caval, Saša (University of Reading)

Presentation Format: Oral

The island of Mauritius saw a massive demographic and ecological reconfiguration three times in the past: first when an unpopulated island was settled by the Dutch in 1598. They abandoned the island in 1710, and (2) a few years later the French took it, imported large numbers of slaves, mainly from Africa and initiate a sugarcane plantation economy. The third change was from the 1830s on, with the rapid influx of some half-million indentured labourers, predominantly from India, which were brought in to replace slaves after abolition, and the intensification of sugar cane industry. When emigrating to Mauritius, the settlers brought

their religious beliefs and practices, which have been essential for people adapting to, and reorganizing their domestic and public lives. In a new environment, the idea of a congregation became very meaningful and had been central to the creation of a community(s).

This paper draws on the complexity of everyday spiritual practices and religious negotiations with the society at large of all inhabitants of Mauritius, European colonizers, both French and British, and African, Indian and Chinese slaves and indentured workers, during the colonial period. The standing position of separate groups varied, however individuals and communities endeavoured to position themselves within a multi-religious, but essentially displaced society. A few locations offer the rich tapestry of sacred structures and religious topography as seen on the island, which is at the same time fundamentally connected and deeply contrasted to the indistinct sugarcane that blankets the terrain.

4 STATE FORMATION AND THE INTRODUCTION OF BUDDHISM TO JAPAN

Author(s): Sasaki, Kenichi (Meiji University)

Presentation Format: Oral

Buddhism was introduced to Japan in 538 A.D. when the construction of keyhole-shaped mounded tombs gradually lost its significance as the status symbol. Large circular or square mounded tombs became the elite status symbol in the late sixth century. In the seventh century, the construction of Buddhist temples became the symbol of authority, replacing the construction of giant mounded tombs. By this time, Japan grew to be a mature state, having adopted the Chinese-style bureaucracy. Yet, the introduction of Buddhist temples to various local regions of Japan was very regionally distinctive. In a few regions, construction of a Buddhist temple took place right after the completion of the newest square mounded tomb. In other regions, Buddhist temples were constructed for the first time toward the end of the seventh century or even in the eighth century, some or long time after the newest square mounded tomb was constructed. Based on this strong regional difference, the author intends to argue that, even in the seventh century when the Japanese society seems to have evolved to a centralized state, some local polities remained somewhat autonomous and independent from the central polity.

5 COLONIAL AND POST-COLONIAL PORT INFRASTRUCTURE AND THE ENVIRONMENT – TANGIER (MOROCCO): 1471—C. 1700

Author(s): Elbl, Martin Malcolm (Portuguese Studies Review; Trent University; Baywolf Press)

Presentation Format: Oral

The paper examines in detail the putative, documented, and computer-modeled environmental effects of the transition, in the Port of Tangier (Morocco, Strait of Gibraltar), from initial Portuguese occupation in 1471 to the English attempts to create a modern naval base after 1662, to the aftereffects of the demolition in 1683-4 (English evacuation) and to the re-establishment of Moroccan control. The research constitutes an expansion module to the as yet unreleased revised and augmented “Pre-Modern Tangier (the Médina and Micro-Regional Context) Dataset Ver. 2.1”. The analysis focuses on the hydrographic impact of the first Portuguese jetty and breakwater in the “Old Port”, on the characteristics and environmental impact of the English “Mole” breakwater (including the impact of local stone quarrying), on the likely impact of the Portuguese and then English management of underground water conduits and sewage facilities, and on conclusions to be drawn from the English attempts to maintain, improve, and re-engineer water supply facilities for English warships. The paper presents an augmented and improved bathymetric DTM of the Old Port of Tangier, with improved estimates of the location, scope, and likely sedimentation impact of the harbor works, together with an analysis of the processes attendant on their demolition, the natural degradation of the vestiges, and the partial reuse of those medieval and early modern vestiges for proposed, realized, and shelved colonial harbor works and projects between 1905 and 1945. The paper models the vanished installations (now deep under the structures of the modern port) and their environmental effects using data retrieved from fiscal, military, field survey, coastal survey, construction, and historical depth sounding records, fitted into a 3D georegistered framework that seeks to include the past stream, marsh, and lagoon hydrography of the hinterland and the likely discharge regimes under climatic conditions prevalent from c. 1450 to c. 1750.

6 ARCHAEOLOGICAL GEOPHYSICS AT CHRISTIANSBORG/OSU, GHANA

Author(s): Callanan, Martin (Dept of Historical Studies, NTNU Norwegian University of Science and Technology) - Breivik, Heidi - Stamnes, Arne (Dept of Archaeology and Cultural History, NTNU University Museum)

Presentation Format: Oral

Many forts and castles from the transatlantic slave trade are preserved along the coast of West Africa. Christiansborg Castle, lying on the coast of Ghana, is a well-preserved castle from this period that is designated as a UNESCO heritage site. It has had a complex history that continues up until today. The Castle served as the headquarters for the Danish-Norwegian engagement in the transatlantic slave trade, between the mid-1650s until 1850. Following a period of British colonial rule, the Castle complex was further developed and expanded as a Ghanaian government complex that is still in use. The site comprises of the castle itself, including its' different extensions, as well as the castle grounds and a number of different associated sites (houses, gardens etc.) in the near vicinity.

Much is known about the appearance and development of the castle and surrounding buildings during certain periods from the many documents, paintings and images that are preserved until today. And the area has been the object of heritage and surface surveys. In addition, limited archaeological excavations are currently being carried out within the Castle grounds, by a Ghanaian

project.

Despite this, many basic questions remain about the nature and extension of the settlement that surrounded Christiansborg. Similarly, the precise past location of several key sites that are today absent has not been established.

In this presentation, we report the results of a recent geophysical survey, carried out at Christiansborg in November 2018. The survey was a limited pilot survey: But the results and experiences, produced are relevant both for the historical archaeology of the region, as well as for discussions regarding the potentials and problems associated with applying geophysics on sites in the region.

7 FROM DATA TO POLICY: HOW CAN HISTORICAL ARCHAEOLOGY CONTRIBUTE?

Author(s): Seetah, Krish (Stanford University)

Presentation Format: Oral

Deeply rooted connections exist between the period we consider as 'historical archaeology' and the present-day. This is perhaps best exemplified by the activity that characterizes the recent past: massive landscape transformation, extensive demographic flux, and escalated trade and exchange. Given these large-scale human-environmental changes, can the associated data – sequestered and effectively segregated from an archaeological agenda – be useful for speaking to policy makers?

This presentation offers three case studies from Europe and Africa that utilize an archaeological approach, and archaeo-historic datasets, with the express intent of contributing to policy. This support for policy development is based either on model building, or direct integration of 'heritage' into new management strategies by local government in former colonial states. Overall, the aim of the presentation is to demonstrate the increasingly important role archaeology can play within the context of supporting resilience in the face of increasingly complex political, social and ecological contexts.

337 THE HAPTIC DIMENSION OF ARCHAEOLOGICAL OBJECTS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Melko, Nadja (University of Zurich) - Von Räden, Constance (University of Bochum)

Format: Regular session

The interplay between archaeology, (neuro-)anthropology, ethnology and sociology brought new approaches into focus as for instance what we call the field of implicit knowledge, embodiment of knowledge or what has been more recently discussed as extended mind. As a consequence archaeological objects were given two new levels of consideration: One the one hand things could show us an ongoing or completed process of appropriation of materials and tools by a craftsperson, who acts within a knowledge system. On the other hand things reflect the practices of the consumers and thus also the habitualized activities guided by their body knowledge. Therefore our sensual experience with things as a source for relevant information revealed itself.

This session seeks not only to discuss the theoretical background but most of all tries to take the next necessary step – the application in the archaeological routine. Our interpretations of objects are usually (and understandably) generated from drawings, photographs and description but the information pool of the sensory dimension is still neglected.

A focused discussion on the process of acquisition in crafts or on the daily usage of things could open another level of consideration, which will enrich our previous interpretations. An intensive exchange with craftspeople helps to understand how things are made within a system of values and well directed experiments may replace the selective use of existing ethnological studies.

Will we recognise which marks of an object are culturally bound and which are an effect of a law of nature expressed during the process of making?

Contributions presenting the cooperation with craftspeople/schools of craft are welcome. Process-based or experimentally/ethnoarchaeologically supported methods and their application to archaeological material will be discussed with their advantages or disadvantages. Also welcome are contributions regarding chances and challenges within the interdisciplinary exchange between the different mentioned sciences and crafts.

ABSTRACTS

1 INTRODUCTION

Author(s): Melko, Nadja (University of Zurich) - von Räden, Constance (Ruhr-University Bochum)

Presentation Format: Oral

Craft is guided by the body knowledge of the practitioner. Being a mostly non-verbalised part of the crafting process, this field of knowledge is overshadowed by the dominance of our visual perception and therefore still mostly neglected in the archaeological analysis of things.

While developing new process-based approaches (e.g. practitioner-researchers or researchers co-working with craftspeople) we constantly have to reconsider the applicability of these theories to the analysis of the archaeological object. In addition, the issue arises how we may deal with already traditionally classified findings? Another step to take is to make this knowledge

accessible to a greater group of researchers. Is it possible to create some kind of toolbox including the insights of the theories around embodiment and implicit knowledge, so that it can be used in the daily archaeological routine?

This session will not only pay attention to the theoretical trends but also display diverse case studies through the ages including copper smelting, seal production, the use of image-artefacts, pottery production, rock art, figurines and adornment.

Regarding these various materials and objects these case studies reveal learning networks, analyse sequences/backgrounds of crafting gestures as well as the choice of raw materials by using fruitfully the cooperation with craftspeople. Furthermore childhood studies will be presented as a promising source to examine the process of appropriation.

2 THE HAPTIC DIMENSION OF ARCHAEOLOGICAL ARTEFACTS: BETWEEN DOGMA AND PRAGMA

Author(s): von Rüden, Constance (Ruhr-University Bochum)

Presentation Format: Oral

The almost exclusive focus on the visual perception of artefacts in archaeology and anthropology has been extensively criticized for the last 20 years at least. This discourse opened completely new theoretical perspectives on archaeological things by integrating further sensual experiences as for instance olfaction, hearing or the tactility in our constructs of ideas (cf. Hamilakis 2014). However, despite its importance the discourse largely remained on a theoretical and thus often rather abstract, intellectual level. Especially its integration into the empirical data of archaeological field research is often still awkward or superficial.

Touch, with its "boundary-blurring properties" (Howes – Classen 2014, 8) and its characteristic to evidently bridge the cartesian idea of subject and object is of particular importance for the making of artefacts. To integrate the craftspeople's bodily experience of the involved tools and raw materials as for instance clay, plaster or wood, is essential for our understanding of ancient manufacturing processes. Thus, based on theoretical considerations drawing on phenomenology as well as practice theory, the paper aims to explore not only the importance of such an approach in the study of the material remains of ancient craft, but also possible methodological ways to tightly interweave the above mentioned theoretical and philosophical ideas into the daily archaeological routine.

3 WHY SHOULD ARCHAEOLOGISTS COLLABORATE WITH CRAFTS PEOPLE?

Author(s): Høgseth, Harald (University of Gothenburg) - Groth, Camilla (University of Gothenburg; University of Southeast Norway) - Melin, Karl-Magnus (University of Gothenburg)

Presentation Format: Oral

Interdisciplinary research is promoted as a way forward in coping with the growing complexity of research environments. In the context of archaeology, the knowhow of crafts persons has a great potential in aiding in the reconstruction of past events as well as in the understanding of the many background factors that shaped those events. While crafts persons have traditionally been occupied with their own craft rather than pursuing academic careers, the situation is now changing as education in the arts and crafts have moved into the academic institutions. The growing number of crafts persons with an academic interest and skills make these practitioners ample T-shaped collaborators especially in the field of archaeology and conservation. In this presentation we will discuss three cases of collaborative practices between archaeologists/conservators and craftspeople and point to the new breed of practitioner-researchers who incorporate both of these practices in their academic profiles. Drawing on embodied cognition theory and auto-ethnographical reflections, we will dive deep into the crafts persons experiential and embodied knowing and point to the importance of the sensory spectrum in this context. Also, aspects of empathy and affect emerge in this process. Through this analysis we will present the possible benefits and challenges that interdisciplinary teams can expect when inviting crafts people into their research teams.

4 TEXTURES, GESTURES, RECIPES: CRAFTING EMBODIED SKILL

Author(s): Relaki, Maria (Université catholique de Louvain)

Presentation Format: Oral

The discussion of ancient material culture has recently shifted from a narrow focus on the finished objects to broader considerations of materiality that emphasize affinities at the level of production. This shift has also called into question the conventional dualism between creator/subject and material/object premised on the application of a mental design onto a passive material substance. Instead, technical objects are seen to emerge out of the dialogue between materials and makers; materials provide affordances for action, guiding the choices and decisions of the craftspeople, and therefore, play as much a role in the process of creation, as the human hand that manipulates them. Building on these ideas, I discuss an aspect of the technical process that has perhaps received less attention so far: in the cases where identical objects are created in different materials, how do we understand technical becoming, and especially the synergy between concept and material? Is it useful to speak of prototypes and imitations? Would that dissolve the entangled coming into being of technical objects? The role of imitation in this discussion has been mainly to validate a sterile hierarchy of more and less 'valuable' raw materials. I suggest instead that we should examine imitation as embodied skill and a key stage in the process of technical emergence. To do this we must focus on how technical objects participate in and reproduce shared value systems created by craft practice. I will illustrate my suggestions with examples from the Bronze Age Aegean.

5 IMAGES THAT YOU FEEL - THE HAPTIC ASPECTS OF VISUAL CULTURE IN MESOPOTAMIA

Author(s): Wagner-Durand, Elisabeth (IANES / Tübingen)

Presentation Format: Oral

The primacy of the visual has governed the analyses of images ever since. Whereas it is more than comprehensible that images (pictures), are primarily approached, analyzed and interpreted via their visual dimension, they still represent artifacts / features with certain material properties who address more than the sense of sight. Thus, this paper proposes a multi-sensory approach to image-artifacts. The aim is to address issues of haptic properties either directly inherent in the objects' materiality or simulated by the craftsman's treatment of the material. In this vein, issues of synesthesia as intended effects during the production processes are addressed and analyzed too. To do so, focus will be set on both, the archaeological record, the artifacts themselves, as well as the written sources that give insight into the emic perception of sensory aspects of material life in Mesopotamia. The thesis is forwarded that image-artifact perception is a complex and often intentionally practiced interplay of different sensory experiences and expectations that shape the way images are produced in Mesopotamia and beyond.

6 FIGURINES AND THE WAY OF THE HAND: AN APPROACH

Author(s): Murphy, Celine (Heritage Management Organisation)

Presentation Format: Oral

It is common that clay artefacts preserve traces, on their surfaces, of their maker's touch. Manifest in the form of striations or finger imprints, these marks often inform us of the direction of the manufacturers' gestures or of the amount of pressure applied to the material. These observations – which can be made both visually and haptically – can be very helpful for archaeologically understanding the technological implications of their manufacture process.

While such traces have often formed the topic of discussion in research on pottery, this is not so much the case for studies on clay figurines. Figurine studies indeed lack a well thought-out analytical program where the sense of touch is concerned. In this paper, I therefore present a methodology developed precisely for this end. Involving the redefinition and expansion of database categories used for data gathering, and the establishment of an interdisciplinary and collaborative experimental program, the methodology allows for the addressing of a range of new questions focused both on the process of figurine making as well as on the use of the final product.

It is here argued that closer analyses of traces of touch, accompanied by tactile explorations of materials, allow for movement, action and process to be more closely taken into account. It is indeed easy to bypass such considerations when studying artefacts with striking appearances. Movement, action and process, however, remain the foundation of these objects' existence, and often required very specific forms of knowledge and exchange between manufacturers to occur. Thus, the treasure trove of information left by hands requires further examination with hands.

7 CRAFT KNOWLEDGE IN THE SERVICE OF ARCHAEOLOGY – TRACING SKILL, KNOWLEDGE AND INVISIBLE TOOLS

Author(s): Botwid, Katarina (Lund University)

Presentation Format: Oral

Through the Artisanal Perspective craft-knowledge becomes a resource for interpretations and deeper understanding of the past through ancient technologies and crafting issues. During the last ten years a grid of theoretic and practical frameworks has been developed. The author claims that ancient craft-knowledge can be read as a document by contemporary persons with a contemporary craft-knowledge. This paper explores new archaeological insights generated by artisans' understanding of how their craft is performed. It offers a newly developed practical dimension to archaeology, based on skills and craft, revealing the embodied knowledge of the past. The applicability is shown through different case studies. This communicative, interdisciplinary approach offers to take us back to the moment at which items came into being, allowing wooden artefacts to be scrutinised once again by a master woodworker and returning sherds to their origin as malleable clay in the hands of a living potter. The Artisanal Perspective discusses levels of skill and offers new technological insights into materials and manufacturing choices that can be detected through sensory assessments. It offers important complementary information to existing methods and theories used in archaeological analysis, and can be of great importance to both archaeologists and craft-persons in collaboration.

8 TRENCH ART – BETWEEN UTILITARIANISM, ARTISTIC VALUE AND MEANING. HAPTIC OBSERVATION OF OBJECTS CREATED AND REWORKED BY SOLDIERS

Author(s): Niebylski, Jakub (Polish Academy of Sciences, Institute of Archaeology and Ethnology)

Presentation Format: Oral

The trench art is a broad art category which incorporates a wide spectrum of objects created by soldiers, civilians, and prisoners of war during the war or just after the end of war. The oldest samples are connected to the modern war conflicts, however some are present from the nowadays battles as well. The trench art samples are often discovered next to the personal items, equipment, and armaments upon the archaeological sites related to the 1st and 2nd World Wars.

The trench art also includes objects created from scratch under field conditions in the time of need, as well as the standard equipment with the functional modifications which occasionally lead to a totally different application of the tool. Under the

definition of trench art fall also the objects created for commemorating battles and places, as well as personalized objects of everyday usage often decorated with scratched or dotted ornaments. Such ornaments usually represent anthropomorphic, zoomorphic or floristic images. Very frequently the ornaments pose as a rich source of information containing inscriptions or quotes, as well as dates and signatures. Such pieces of information may be helpful for identifying the soldier, as well as reconstructing his military route.

The scientific studies of the trench art artifacts from the battlefields and war cemeteries enables us to get a better understanding of their creators i.e. soldiers. During this studies one must test a piece of the trench art organoleptically, for in such a way one can interpret and read the intentions of its creator. Such pieces of trench art are often exhibited in the glass showcases which limit the observation of the objects in the haptic dimension. The sensual experiences which go along with the demonstrating the use of the object help us understand why the specific material or specific ready-made parts were used.

9 WHEEL THROWING AND CULTURAL SIGNATURE

Author(s): Roux, Valentine (Maison de l'Archeologie et de l'Ethnologie)

Presentation Format: Oral

Any craft is the expression of cultural "choices" whose transmission across generations participates directly to the cultural signature of the social group the craft people belong to. This is true even for a widespread technique such as wheel throwing as shown by the potters of Hebron. They throw their pots following an original method involving at least two distinct steps. Experiments show that the same pots could be obtained with a faster method which is also known from them. When measuring the constraints in terms of collapse, the two-step method seems however more efficient in view of the potters' intention, namely the throwing of final shapes without any post-throwing preforming or finishing operations. The Hebronite tradition is visible on the finished products thanks to diagnostic attributes. The latter should enable us to trace back this tradition across time. It has already been identified on 20th century ceramic collections. We conclude that technical gestures are the variable by excellence to trace social groups across space and time.

10 BACK TO THE POTS – FROM THEORY TO METHOD USING THE CONCEPT OF EMBODIED KNOWLEDGE

Author(s): Melko, Nadja (University of Zurich)

Presentation Format: Oral

Several recent studies have shown how co-working between archaeologists and craftspeople, and correspondingly the intense engagement in the field of implicit knowledge, positively changed our approach on archaeological objects. In parallel and connected with this the Neurosciences provided an important insight for the understanding of the process of appropriation: Together with craftspeople they described not only the impact of the crafting process but also of the transfer of craft-bound values on the neuronal system.

Subsequently distribution patterns are no longer a mere expression of the mobility of objects but also of the mobility of ideas. These ideas are created, spread and maintained through networks of practice and networks of learning – using the individual bodies of their members to store knowledge.

But confronted with objects during the daily archaeological routine, how exactly can we distinguish relevant features of an object? Which features are based on certain values bound to a learning network, which are based on an individual level of appropriation and which on the anatomy of the craftsperson? Together with members of the School for Pottery in Landshut these kinds of thoughts were applied on Roman Common Ware from a pottery complex in the region around the Lake Zurich. Together we were able to reconstruct crafting mechanisms and crafting networks behind diverse traces on certain vessels, which will be displayed.

11 RETRO-ENGINEERING AS A HUMANISTIC PRAXIS. WHAT ARE ARCHAEOLOGISTS TAKING APART, AND WHAT CAN BE PUT TOGETHER?

Author(s): Høgseth, Harald (University of Gothenburg) - Vennatrø, Ragnar (Norges teknisk-naturvitenskaplige Universitet - NTNU)

Presentation Format: Oral

As skilled fieldworkers, surveyors, site managers and disseminators, archaeologists are practitioners of the craft of archaeology as well as archaeology in a purely academical sense. In broad terms, archaeology as craft might be described as retro - engineering: An analytical praxis of dismantling material remains in order to understand the practical knowledge, technology and intended purpose of an original complexity. In archaeological terms: excavation, embodied interpretation and reconstruction also describes these operations.

In real life, archaeology as craft unfolds by side with other skilled practitioners, expertise, authorities and craft persons. In this situation, the praxis of archaeology is always socially moderated by other praxis. In addition to any interdisciplinary exchange, a direct outcome of this is a social positioning of practitioners in relation to the material world we study. From where we are reaching is therefor also an important matter in relation to a practical understanding of a material.

Archaeological retro-engineering may be able to analyse more than material components. It is a perspective always dealing with an intentional/nonintentional human vs. non-human interplay. This can also make an embodied analysis intrinsic anthropocentric. What, then, can archaeological retro-engineering successfully take apart, and what may we be able or unable to put together

again in a comprehensive way?

12 COPPER SMELTING - TO SUCCEED OR NOT TO SUCCEED; THE QUESTION IS WHY?

Author(s): Anfinset, Nils (University Museum, University of Bergen) - Goldenberg, Gert (Institut für Archäologien, Universität Innsbruck) - Hanning, Erica (Labor für Experimentelle Archäologie, Römisch-Germanisches Zentralmuseum Mainz)

Presentation Format: Oral

Over the last decades, the interest in extractive copper metallurgy in archaeology has increased dramatically. This is not only due to the application of new scientific methods, which have increased our understanding of the distribution of metals in prehistoric Europe, but also due to intensive prospection and archaeological excavations - particularly in the Alpine region of Europe - which have brought to light new and important empirical material. In this region there are a large number of Bronze Age and Early Iron Age copper ore mines and smelting places, where remains of furnaces as well as other inorganic and organic remains connected to smelting process have been discovered. This has given us an understanding of the smelting process and its technological requirements. Combined with ethnographic descriptions of traditional copper ore mining and smelting in Nepal, this has given a unique opportunity to actually perform experimental copper ore smelting based on both archaeological and ethnographic material. Therefore, over the last 10 years, we have tried to duplicate and reproduce the copper ore smelting process through experimental archaeology. Based on ethnographic accounts and descriptions the process and its requirements, this should be a more or less straight forward line to success. However, as it turned out, it was not as easy to reproduce the smelting and to obtain copper in a satisfying quality and quantity as we thought. This raised the question of why? We aim in this paper to approach this problem both theoretically and practically, by looking into themes of implicit, explicit, and tacit knowledge, issues connected to embodiment of knowledge and the extended mind in order to explain the missing success. What was lacking in order to achieve successful smelting, are there just technological requirements that are missing or is it mainly a problem of our missing "tacit knowledge"?

13 SENSORY APPROACHES TO AEGEAN SEALSTONES: INVESTIGATING QUESTIONS OF CRAFTSMANSHIP AND USE

Author(s): Papadimitriou, Nikolas - Finlayson, Sarah (University of Heidelberg)

Presentation Format: Oral

Aegean sealstones have been studied extensively from stylistic, iconographic and administrative perspectives. By contrast, their technology and practical use - both requiring a strong haptic relation to the objects - have attracted limited scholarly attention. The project "3D-forensic analysis and contextualisation of Aegean seals and sealings", currently underway at the Institute of Classical Archaeology, University of Heidelberg, combines traditional methods of study with 3D model analysis and experimental archaeology in order to explore questions of craftsmanship and usage. In this paper, we will discuss two subjects:

a) The shift of seal-engraving technology from soft to hard stones around 1700 BC: it will be argued that the shift was the result of developments in crafting techniques, which led from free-hand tools to a manually rotating one, and from there to complex devices for fast mechanical rotation. This innovation, which was based on the appropriation of pre-existing technical affordances, changed drastically the bodily movements of craftsmen and, by consequence, their mental approach to the craft.

b) The actual practice of sealing: to complement and enrich the information derived from 3D analysis of seal impressions, we are using practical experiments to explore how the seal user's movements are fixed in the clay. Considerations include how differently shaped seals fit in the hand and guide their own usage, the relative values of intuition and experience, and the processes by which the frequent use of seals leads towards embodied knowledge.

14 FROM TRACE TO TOOL - FROM MOVEMENT TO PRACTICE. A CRAFTSMAN'S PERSPECTIVE ON MYCENAEAN GOLD TECHNOLOGY

Author(s): Goumas, Akis (Chalkis Art School) - Papadimitriou, Nikolas (University of Heidelberg) - Konstantinidi-Syvridi, Eleni (National Archaeological Museum, Athens)

Presentation Format: Oral

A collaborative study of ancient artefacts by archaeologists and craftsmen can be highly productive. This is because they use different but complementary approaches. Archaeologists examine artefacts as finished entities, and seek to understand their artistic, social or technological contexts. Craftsmen, on the other hand, approach them as assemblages, or compositions, whose various parts retain direct or indirect traces of their formation. By studying these traces, craftsmen can identify (or conjecture) the morphology of the tool(s) used and the technical processes employed in their manufacture. This helps to refine the questions that can be addressed with archaeometric methods. Through this interaction, archaeologists and craftsmen build a solid methodological background, which can eventually lead to reliable experimental reconstructions.

In this paper we will discuss such a collaborative project, which investigates Mycenaean goldsmithing. We will focus on tools and techniques, and explain how we proceed from the identification of traces to the reconstruction of movements and practices. We will demonstrate that the process of manufacture involved different stages of sensory interaction - haptic and other - with materials (gold, other substances used in combination, glues etc.). We will also argue that craftsmen had often to create their own specialized tools to perform advanced techniques. To be functional, such implements had to fit perfectly the craftsmen's hands and sense of touch; for that reason, tool-making was a crucial step in the technical process, and one that determined how

tools could become extensions of the craftsman's body and mind.

338 SEAC 27: ARCHAEOLOGY AND CULTURAL ASTRONOMY, BRIDGING THE GAP BETWEEN TRENCH AND SKY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: González-García, Antonio César (European Society for Astronomy in Culture - SEAC) - Criado Boado, Felipe (European Association of Archaeologists)

Format: Round table

All human societies live under a sky that may have been incorporated into their understanding of the world around them. In a sense, if we define 'astronomy' as the impulse to look up into the sky for whatever purpose, then we can see that every society has had such impulse. Frequently these observations have been variously materialised in mobiliary and parietal art or in monuments. These suggest a fruitful intersection between cultural astronomy and archaeology is possible. But a long series of misunderstandings have kept archaeology and archaeoastronomy apart for a long time.

For mutual progress our two disciplines need to understand why and how this separation occurred and whether it is possible to map out a route out of the impasse. In our view cultural astronomy has made a significant progress in recent decades and now includes different methodological and theoretical trends. An example of this would be the recent proposal for a new 'skyscape archaeology'.

The opportunity to celebrate the 27th annual meeting of the European Society for Astronomy in Culture (SEAC) together with the 25th annual meeting of the European Archaeologists Association (EAA) is a key moment for engaging in a fruitful dialogue between the two disciplines to bridge the gap still existing. Some of the research questions that could be addressed are:

- Is Cultural Astronomy giving answers for questions not (yet) posed by Archaeology?
- Are we (cultural astronomers and archaeologists) asking the same questions?
- Is archaeoastronomy an archaeometry or can it provide something else than data?
- Should the sky be a relevant concept for archaeology?

Two members of each society will lead the debate trying to set the view of the other field from the back sight of their own, finally opening the floor for comments and discussion from the general audience.

339 ETHICS AND PRACTICE IN THE EXCAVATION AND ANALYSIS OF HISTORIC HUMAN REMAINS AND ASSOCIATED CULTURAL MATERIAL

Theme: Archaeological theory and methods beyond paradigms

Organisers: Lipkin, Sanna (University of Oulu) - Mytum, Harold (University of Liverpool) - Kallio-Seppä, Titta (University of Oulu) - Ruhl, Erika (SUNY at Buffalo)

Format: Regular session

Over the last 25 years, the archaeological study of historic and recent skeletal and other body tissues, the coffins, burial clothing and accessories and any accompanying items of material culture has become widespread in Europe. Whilst scientifically important, the disturbance, recording and analysis of human remains and any closely associated material culture have ethical dimensions which are unique when related to material from recent centuries. The remains are often in consecrated ground, and the descendants of the deceased under study may be identifiable. Preservation may be exceptional, through mummification or embalming, and the ethics of illustrating remains in publications or public displays require careful consideration. This session brings together those experienced in dealing with these assemblages to outline and share not only practice and results but also how the ethical dimension was dealt with in the planning and permission stage, and then in fieldwork, and finally during analysis and dissemination.

The session organisers invite for paper submissions discussing the practice and ethics of not only study, identification and display of human remains, but also the debatable issues concerning the associated textiles, coffins and other material remains.

ABSTRACTS

1 UNDER-CHURCH-FLOOR-BURIALS IN FINLAND: ETHICAL CONSIDERATIONS OF RESEARCH, COMMUNITY ARCHAEOLOGY, AND PUBLISHING

Author(s): Kallio-Seppä, Titta - Lipkin, Sanna - Tranberg, Annemari - Väre, Tiina (University of Oulu)

Presentation Format: Oral

Multidisciplinary research on partly mummified human remains still currently located under the church floors is relatively new in Finland. Two ongoing projects studying Finnish under-church-floor burials have thus encountered various situations during the research and dissemination of information that have required ethical reflections. Obtaining research permits has been dependent on the attitudes of individual congregations. Churches that are already out of active use are more easily persuaded to allow the research and, for example, sampling of the remains and associated burial materials than those churches that still actively serve as the primary sacred places of the congregations. Community archaeology done in collaboration with schools and muse-

ums has prompted discussions on how the results should be presented and what kind of visual material can be displayed and how for different age groups. We have experienced the importance of explaining not only the traditions and stories related to death, but also the characteristics of the earlier societies in which diseases and infant mortality played a major role.

2 HUMAN REMAINS AND ASSOCIATED CULTURAL MATERIAL FROM ENGLISH CONSECRATED BURIAL GROUNDS: UNPICKING ETHICS AND PRACTICE IN THE 2017 APABE GUIDANCE

Author(s): Mytum, Harold (University of Liverpool)

Presentation Format: Oral

The Advisory Panel for the Archaeology of Burials in England (APABE) was established with a slightly different name in 2005, and it is still an important collaborative advisory panel. It combines the views of Historic England as secular guardians of the heritage and the Church of England as the body both legally and ethically responsible for many, though not all, of the historic consecrated burial grounds, though none of the members of the committee or the consultative forum are clergy. This paper examines the ethical framework proposed in the 2017 guidance, and it considers how this is now manifested in practice in small-scale and large-scale disturbance of human remains. Whilst the guidance has been a collaborative process, there are still numerous and at times competing interpretations and aspirations as to how the guidance may evolve. The culturally sensitive post-modern tradition of archaeology accepts diverse viewpoints (to which the religious communities would associate) regarding the meanings and values of human remains. This contextual approach is often in conflict with the hard science attitude to human remains as a resource to be exploited over the long term to better understand the past.

3 LEGAL AND ETHICAL ASPECTS OF HUMAN REMAINS IN POLISH ARCHAEOLOGY

Author(s): Rutyna, Magdalena - Wojtkowska, Agnieszka (Cardinal Stefan Wyszyński University in Warsaw)

Presentation Format: Oral

Human remains excavated in the course of archaeological excavations change their status. The dead from the past become a medium of information. When examining the problem of human corpses, a question arises as to the status of the dead body – is a corpse solely dead matter with no dignity or should it be treated in a respectful and tactful manner?

In Polish legislation, human corpses and remains are considered as a good that is difficult to be determined in terms of content and substance. Specific regulations regarding specific contents can be found in penal law, administrative law and international law.

What constitutes the problem is the justification of excavating and scientifically examining human remains. The cause of conflicts lies in the difference between the expectations of the living and the rights of the dead. In the scientific discourse, human remains constitute an evidence, a testimony to the past. However, treating human remains as objects of analysis leads to dehumanisation of the dead body.

Sadly, it should be stressed that some archaeologists adopt a somewhat arbitrary approach to the subject of ethical treatment of human remains uncovered during excavations. This is evidenced by the fact that in Poland, only one code of ethics addresses the matter of a dignified treatment of human remains.

The presented paper, apart from discussing the legal and ethical aspects of human remains in Polish archaeology, also presents specific examples of problems tackled by archaeologists examining burial sites – from prehistoric cemeteries and early medieval barrows to modern exhumations of the Cursed Soldiers.

4 RIGHT OR WRONG? ETHIC ISSUES IN THE MUSEALISATION OF HUMAN REMAINS FROM LEOPOLICENCELLE (VITERBO, ITALY)

Author(s): Crescenzi, Nicole (Sapienza University of Rome) - Baldoni, Marica - Martinez-Labarga, Cristina (University of Rome Tor Vergata) - Stasolla, Francesca Romana (Sapienza University of Rome)

Presentation Format: Oral

“Why excavate skeletons? What information can we obtain that justify the disturbance of human interments?”¹ In the ongoing debate over the disposition and scientific analysis of ancient human remains, the ethical issues surrounding skeletal research, evolutionary medicine and the maintenance of skeletal collection tend to be reduced to simplistic oppositions: science vs religion, right vs wrong, etc. Even the exhibition of human remains represents a strongly debated and controversial subject. Many ethical issues have been brought up, concerning the right preservation of human remains, the respectful treatment they should receive, but also which will be the reactions and feelings their display could raise in their descendants and in the public in general²⁻³. From a scientific point of view, the analysis of human skeletal remains represent a unique source of information enhancing our understanding of human evolution and histories with both local and global implications⁴.

Human skeletal remains are considered part of the cultural heritage defined for the first time in 1954 in the Convention of Aja and then by the UNESCO in 1970 as “every artifacts or natural/biological formation considered important for religious, archaeological, historical, artistic and scientific purposes”⁵.

In order to try to solve some of the ethical issues raised, guidelines have been created for museum curators to follow⁶. In particular, a policy of cooperation with known descendants is strongly suggested, to ensure the right preservation and a respectful, professional and rightfully contextualized exhibition.

The present study will present the afford to solve ethic problematics in a real multidisciplinary case study related to the analysis and the exhibit of a sample of human skeletal remains from the archaeological site of Leopoli-Cencelle (Viterbo, Italy).

5 OBJECTS BECOMING SUBJECTS

Author(s): Nicolis, Franco (Archaeological Heritage Office - Autonomous Province of Trento - Italy)

Presentation Format: Oral

Following the climatic changes, the Archaeological Heritage Office of the Autonomous Province of Trento has recovered in Alpine glacial environments the remains of soldiers fallen during the First World War. The presence of personal objects could in some cases provide elements of knowledge of these "discards of history", and the careful restoration of paper fragments allowed the identification of one of them.

Memory is a dynamic matter, it is not a fact, it is an act. But the active memory of the Great War died with the death of the last soldiers who had taken part, leaving room for post-memory. What remain now are their documents, written testimonies, photos. But there is also another memory, the material one, which reappears in the form of shapeless fragments, rags and scraps.

In a small exhibition we have exposed elements of the clothing and military equipment of two Italian Alpine soldiers and two soldiers of the Austrian army. The exhibition did not want to be a simple exposition of historical materials but intended to celebrate the lives of the four soldiers through the material expressions that represent them, indeed, that still embody them. The uniforms, though emptied, represent in fact the corporeity of reality, they are the memory of materiality, "they are" those bodies, "they are" those people: they are not objects, they are subjects. The body becomes uniform, the uniform generates memory and reopens the dim eyes of the absent witnesses.

Digging the materiality of humanity requires a vigilant, attentive vision that is able to maintain a stable balance between a methodologically correct professional approach, and as such the most objective and detached as possible, a natural emotional involvement and an ethical approach, which is however difficult to define and which usually is expressed only through a generic "respect".

6 SAMPLING FAUNAL AND FLORAL REMAINS FROM COFFINS - WHAT BELONGS TO A BURIAL?

Author(s): Tranberg, Annemari (Oulu University)

Presentation Format: Oral

There are a lot of fruitful conversation concerning about ethical questions related to the archaeological research on burials. But what forms a burial? This paper converses on early modern church graves at the coastal area of Finland. A burial usually includes a body, fabrics, objects, ornaments, and plants buried with the deceased. Among other things, these under-floor burials were provided for several reasons with different plants, etc. spruce sprig, sawdust, birch bark or hay. However, after the ceremony the coffins have filled with other remains, which were not a part of the original burial. How about the post-burial remains such as insects and rodent traces? How to deal with them? Sometimes burials have been disturbed by several different parties causing changes. Whether handling the remains is allowed seems to be case related. Who can determine what belongs to a burial? This paper discusses how these post-burial remains have been handled.

7 ETHICAL CONSIDERATIONS REGARDING DONATED SKELETAL COLLECTIONS

Author(s): Maijanen, Heli (University of Oulu) - Steadman, Dawnie (University of Tennessee)

Presentation Format: Oral

Biological anthropologists and bioarchaeologists study human skeletal remains in various contexts. Research is commonly conducted using skeletal collections, which can originate from archaeological sites without known identity of the deceased or they can be from identified (documented) collections with varying degrees of information on the individuals. Documented collections can constitute of remains from cadavers, historical or contemporary cemeteries, or donation programs.

No skeletal collection is free from ethical concerns, even though the type of issues may vary depending on the origins of the remains. Some of the most profound issues are the right to burial, consent to study and the anonymity of the deceased. Contemporary whole body donations are usually self-donated (willed while living) or donated by family members after death. In either scenario, not all family members may be supportive of body donation and requests may be made to return the remains. From a research perspective, the curators of body donation collections must protect the anonymity of the donors whilst encouraging free access to qualified researchers. Anonymity is becoming more difficult as new technologies emerge, such as genetic sequencing, genotype/phenotype studies, digitization, biometrics, and medical devices, which may directly or indirectly divulge the identity of the donor or, in the case of genetics, the identity of family members. Curators must also consider the long-term impact of destructive analysis requests, particularly to limited resources such as teeth. Finally, data sharing policies that explicitly state the expectations and limitations of data use are critical to ensuring fair and ethical dissemination of data and results among researchers. This presentation will demonstrate many of the ethical dimensions of body donation using a large, contemporary donated skeletal collection, The W. M. Bass Donated Skeletal Collection as an example.

8 ETHICAL ASPECTS OF MASS GRAVE INVESTIGATIONS IN RECENT ARMED CONFLICTS – EXAMPLES FROM THE FIELD OF FORENSIC SCIENCE

Author(s): Moilanen, Ulla (University of Turku) - Ranta, Helena - Sajantila, Antti (University of Helsinki) - Taavitsainen, Jussi-Pekka (University of Turku)

Presentation Format: Oral

Over the last decades, forensic experts have participated in investigations of individual burial places and mass graves from recent armed conflicts around the world. These investigations have given rise to ethical principles and recommendations, which have been published e.g. as the Resolution of United Nations Human Rights Council on Human rights and forensic science (E/CN.4/RES/2005/26), as the resolution on Forensic genetics and human rights (A/HRC/RES/15/5), and UN Principles on the Effective Prevention and Investigation of Extra-Legal, Arbitrary and Summary Executions (also known as Minnesota protocol). These resolutions and recommendations address the dignified handling and management of human remains and restoring the identity of victims, among other things. In this paper, forensic investigations of mass graves and alleged human rights violations in former Yugoslavia are presented as an example to present the differences in the ethical principles applied in forensic science and archaeology. We also consider whether archaeology teams can learn from the ethical issues and recommendations of forensic science, and ask could these recommendations be incorporated in archaeological excavations and studies of sites with particularly sensitive aspects and issues, such as grave sites of the victims of recent civil wars and world wars?

9 CHARMED LIVES? CHILDREN'S BURIALS AND PRIVILEGE IN ARCHAEOLOGICAL ETHICS

Author(s): Ruhl, Erika (SUNY at Buffalo) - Tuovinen, Saara - Lipkin, Sanna (University of Oulu)

Presentation Format: Oral

Archaeology as a discipline has increasingly challenged the privileging - prioritizing or favoring - of some narratives over others. While discussions of wealth and status often present such privilege as a case of "haves" and "have nots", in reality these concepts are less clear-cut, as individuals who enjoy privilege in one area may not be privileged in others.

As such, it is important to recognize the ways privilege is created and enforced on two levels: (1) how individuals were treated and interred in the past, and (2) the ways in which their remains are archaeologically interpreted and presented today. This paper considers these levels in the context of a series of children's burials from pre-modern northern Finland which occupies a unique niche, representing economically privileged children buried in often prestigious locations, who receive unique treatment in contrast with their elders. In the present, this requires a critical consideration of how current conceptions and prejudices around the death of a child presented to the public at large, as these beliefs can under-privilege conversations around children and childhood in the past.

This paper addresses the following questions: How is privilege seen as a complex concept in archaeological burials? How do changes in modern perceptions of privilege shift presentations of the past? Do other factors (such as preservation bias) impact archaeological presentations of these identities? What impacts does developing perceptions of privilege have on ethical obligations?

Archaeology has a great deal of potential to present a more holistic picture, but must do so in an intentional, critical, ethical and informed manner to avoid perpetuating current biases.

340 BUILDING A FUTURE FOR URBAN ARCHAEOLOGY: THE URBAN ARCHAEOLOGICAL COMMUNITY AT WORK

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands) - Belford, Paul (Clwyd-Powys Archaeological Trust)

Format: Round table

At the Barcelona meeting, the EAA Community for Urban Archaeology was officially started. It was a highly dynamic session with a highly engaged audience. The result was a flying start for the community with big plans for the future. The community now has its own website and a first meeting outside of the regular conferences. Also, the first book will be published in early 2019. But now we are going to move further forward!

In this roundtable session we are going to discuss the position of archaeologists within the urban context over the next decade. The world is changing. There is a growing involvement of the public. Archaeological research is not always obvious, and archaeologists have to 'fight' other interests at stake. But also, huge steps can be made in archaeological research by using new scientific research techniques. On the other hand, at complicated sites with a huge amount of data, how to choose the right strategy within the financial constraints? We are going to investigate together the most important topics at hand and create a top five list of themes which the community will develop during the next couple of years at the future conferences with our own sessions, discussions and publications. Participants at this session will be the participants of our community at work for a better future for urban archaeology in the decade(s) to come!

PUBLICLY SPEAKING: THE CHANGING FACE OF PUBLIC ARCHAEOLOGY AND INTERNATIONAL HERITAGE INTERPRETATION, EAA 25

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Jameson, John H (ICIP ICOMOS; 12,000 Year History Park; EJA Editorial Board) - Skeates, Robin (Department of Archaeology, Durham University; EJA Editorial Board)

Format: Regular session

Public Archaeology (sometimes equated with “Community Archaeology” in the UK and elsewhere) is the practice of presenting archaeological data and interpretations of that data to the public. Projects labelled as “community archaeology” tend to emphasize substantial efforts in community engagement and power sharing. International guidelines and terminology in public interpretation and presentation practice are provided by the ICOMOS Charter on Interpretation and Presentation of Cultural Heritage Sites and other specialized organizations engaged in international interpretation collaboration such as Interpret Europe, the National Association of Interpretation, and the Association for Heritage Interpretation. The ICOMOS charter of 2008 provided definitions of ‘presentation’ and ‘interpretation’ and other terms as well as principles and objectives for interpretation that have been used and applied, and to some extent redefined in the decade since, for public archaeology practice. In these activities internationally, who is “the public” in differing contexts? How are principles of public interpretation applied by public archaeologists in geographically and culturally diverse settings? Do these terms and principles have global relevance or is there a need to develop separate, idiosyncratic, and culturally defined methodologies and approaches? What are the common denominators? How are the challenges in archaeological heritage interpretation changing the image and practice of public archaeology today?

ABSTRACTS

1 CAN WE BE IMPARTIAL GUARDIANS? CHALLENGES IN ARCHAEOLOGICAL HERITAGE INTERPRETATION IN PUBLIC ARCHAEOLOGY PRACTICE

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

Presentation Format: Oral

Public Archaeology is the practice of presenting archaeological data and interpretations of that data to the public. It aims to create an open, participatory and rational-critical debate in integrating public and stakeholder values into decision making processes and project outcomes. Projects labelled as “community archaeology” emphasize community engagement and power sharing. The public interpretation of archaeology is the process of demonstrating societal relevance and communicating resource meanings and aims to enable and promote public support. Organizations such as the U.S. National Park Service, Interpret Europe, the National Association of Interpretation, and the Association for Heritage Interpretation have been traditional leaders in public interpretation, espousing a philosophy of interpretation that emphasizes provocation and the individualized “experience” of the audience; the most provocative and powerful story is the one that has universal meaning. Critics of this approach point out that it is structured to non-formal learning about significance of a place or resource that fails to address adequately the legitimacy and reality of conflicting perspectives. They maintain that heritage is not seen by everyone as a universally recognized and shared resource, nor are its official stewards always regarded as impartial guardians. The 2008 ICOMOS Charter provided definitions of ‘presentation’ and ‘interpretation’ as well as principles and objectives for interpretation that have been used and applied, and to some extent redefined in the decade since, for public archaeology practice. In these philosophical debates, who is ‘the public’ in differing contexts? How are principles of public interpretation applied by public archaeologists in geographically and culturally diverse settings today? Do these terms and principles have global relevance or is there a need to develop separate, idiosyncratic, and culturally defined methodologies and approaches? What are the common denominators? How are the challenges in archaeological heritage interpretation changing the image and practice of public archaeology today?

2 EMOTIONS ACROSS BORDERS: APPLYING AFFECTIVE HERITAGE INTERPRETATION METHODOLOGIES IN INTERCULTURAL SETTINGS

Author(s): Perry, Sara - Apaydin, Veysel (University of York) - Katifori, Vivi (Athena Research and Innovation Center in Information Communication & Knowledge Technologies) - McKinney, Sierra (University of York)

Presentation Format: Oral

Public interpretation of cultural and natural heritage has a deep legacy, extending back millennia as attested to by the archaeological record itself. Yet the formal professionalisation of interpretative practice has progressed most rapidly over the past century, especially in recent decades with the birth of myriad local, national and international expert guidelines, certifying bodies, and other representative organisations. Virtually all such formal structures of professional heritage interpretation recognise the centrality of emotion to its effectiveness: interpretation must inspire, resonate, provoke, move - it must have an *affective* impact - to truly influence people’s understandings of, care for, and future actions around heritage. However, the universalising language and assumptions that underlie this professional rhetoric about emotion take little to no account of cultural difference. Even prominent anthropological and cultural theorists regularly draw on flawed models of affect that mask nuanced patterns of behaviour, privilege Anglo-American epistemologies, or reduce behaviours to innate psychobiological responses.

Guided by Margaret Wetherell’s affective practices model, we present here our experiences in developing and evaluating emo-

tionally-resonant heritage interpretation in the context of the EU-funded EMOTIVE Project (www.emotiveproject.eu). We reflect on intercultural engagements with on-site and off-site (digital) interpretative resources created for the UNESCO World Heritage Site of Çatalhöyük in Turkey. Our preliminary findings hint at cultural (and other) differences in audience response to these resources, and therefore at the need to attune development from the outset to cultural circumstances. We conclude, then, with consideration of existing frameworks for public interpretative practice, questioning whether their universalising tendencies eclipse the local, personal, affective outcomes that are key to care for heritage.

3 EXPERIMENTAL HERITAGE – TRANSLOCAL ART AND ARCHAEOLOGY PRACTICE IN COMMUNITIES IN IRELAND AND SWEDEN

Author(s): Petersson, Bodil (Linnaeus University) - Kerin, Maria - Burke, Danny (Experimental Heritage Project) - Kvamme, Helle (YellowBox Art and Music Centre, Öland)

Presentation Format: Oral

How is heritage made relevant for people in local communities today? In an era of globalization, we try to make explicit the relevance of local heritage in rural areas. Instead of leaning towards internationally recognized consensus heritage with an urban touch, we wish to point towards the meaning of local heritage and local culture, where unique stories, practices, monuments and traditions are approached and staged in, and together with, the local community at the intersection of art and archaeology. We do this through this practice we choose to call Experimental Heritage.

The collaborations between archaeologists, artists (visual artists as well as performance artists, musicians, poets and dancers) and the community are crucial for this way of working, since it is about creating original perspectives and practices relating to locally specific heritage, archaeology and art. All artists and archaeologists in this project have a connection with and knowledge relating to the areas in County Clare, western Ireland and on the island of Öland, southeastern Sweden. The work includes heritage interpretation, community engagement and not least interaction and co-creation.

Going beyond institutional norms and practices, we let the combined arts and archaeology practice for enhanced heritage relevance emerge from within and through landscapes. We thereby avoid the skepticism in today's rural areas towards central institutions, that are often seen as solely representing and primarily embracing authorized and/or urban culture. We develop a translocal practice that can be applied in an international context but that has no strivings to be the singular dominant paradigm.

The international perspective is crucial, but instead of aiming towards dominance, we focus more on sharing practices. Local artists, authors, archaeologists, heritage and culture workers are engaged in the processes of unfolding both the hidden and the more obvious dimensions of local heritage.

4 4000 YEARS AT SIRIUSGATAN - THE CREATION OF A PUBLIC SPACE, USING HERITAGE AND ARCHAEOLOGY FOR INCLUSION AND THE FUTURE

Author(s): Synnestvedt, Anita (University of Gothenburg)

Presentation Format: Oral

In a suburban area in the northeast parts of Gothenburg in Sweden, you can find the remains of a cist grave situated among many high-rise houses. Who cares about these remains today and who knows anything about them? Questions raised in the NEARCH project "Here I live" was how we could make a different kind of archaeological interpretation that could be of some relevance to inhabitants living in the area today. It is a multicultural region with people from about 50 different countries around the world: everybody with their own story. Could there be a theme and a story involving both present and past using archaeology and heritage? People have been living here for 4000 years and this became the theme of the project. Who were those people and what stories can they tell and how do we include the present?

A new kind of signage in cooperation with a landscape architect was designed with the purpose of being a gathering place for storytelling. The installation, which opened September 2018, offers opportunities of sitting down and moving around at different levels. There are panels with many stories and boxes with archaeological material. It is enlightened to be used also during evenings. At the panels, the children's voices from different times are in focus since the site today mostly function as a playground for the children in the area. There is pedagogical material published online and the schools can make use of the site as an outdoor classroom. Different projects connected to the interpretation is ongoing with local associations and the housing company in the area. This project is an example of how a different kind of interpretation might contribute challenging how to think about archaeology and heritage.

5 FUTURE STAGES FOR MUSEUM OBJECTS: THE CASE OF TALLINN CITY MUSEUM

Author(s): Tint, Küllike (Tallinn City Museum) - Tuominen, Suvi (University of Helsinki)

Presentation Format: Oral

The paper discusses a case study where current theories on performance in museum contexts are combined with an event taking place in Tallinn City Museum. Tallinn City Museum preserves and exhibits archaeological materials found in the city of Tallinn from the stone age until the present day. Most of the time the objects are represented in a traditional manner, where a wall of glass is dividing the space and air between the public and the objects. Such form of representation, naturally, cuts the possibility for the museum visitor to sense the multitemporal and ambiguous nature of the archaeological objects. The glass wall distances the visitor from the archaeological objects and at the same time manifests the ownership of the objects. However, due to the

risk of possible damage to the fragile objects, it is also necessary for the museums conservation purposes to protect these materials.

Our case study focused on conceptualising the liminal space between the preservation of museum objects and the engagement of the public. Through methodologies native to live art and various performative practices, we released the objects from their glass cabinets and re-created a different kind of public stage for the objects. Performance artists, lights, scenographic compositions and various other choreographic entities, such as the archaeological objects themselves, assemble a space that brings these archaeological materials physically closer to the visitors yet prevents possible damage to the objects. The performance space transforms into an invisible glass wall that allows the public to connect with the objects through intensive sensory experience without touching. The emergent 'kinesphere', as well as the bodies of the professional performers, convey various meanings and interpretations of the objects.

6 PUBLIC ARCHAEOLOGY IN ANTARCTICA: CURRENT ISSUES AND CHALLENGES

Author(s): Senatore, Maria (CONICET-INAPL, UNPA; ICOMOS IPHC)

Presentation Format: Oral

Antarctica is a particular cultural context for the development of Public Archaeology. It has not indigenous population, and has been ruled by an international governance since the signatory of the Antarctic Treaty in 1959. There are not permanent inhabitants living in the entire continent. Currently it only hosts a temporary population of scientists and support staff, and receives tourists during the summer seasons. Epic accounts of polar explorations have dominated the narratives of Antarctica's past and contributed to a prevailing image of distant wilderness untouched by humans. Archaeological studies and practices in public archaeology have been undertaken from different perspectives that have helped to either reinforce or question the dominant narratives of Antarctic history. This study aims to trace how public archaeology has been understood and developed since the signatory of the Antarctic Treaty. It presents a historical overview, and a comparative analysis of the practices in public archaeology undertaken by different countries to better understand the main issues and challenges that public archaeology faces today.

7 EMBRACING THE POLYSEMANTIC: PUBLIC ARCHAEOLOGY IN PROFESSIONAL EDUCATION

Author(s): Jones, Emily Lena (University of New Mexico)

Presentation Format: Oral

Public archaeology" is a term with multiple meanings. In the USA, this term may signify any combination of the following: cultural resource management; heritage formation, administration, and/or interpretation; formal or informal collaboration with indigenous or other local communities; elementary or secondary archaeological education; and general public outreach, among other definitions. More, the "public" in any of these definitions may vary; it may be international, national, regional, and/or local. Despite this nebulous situation, however, professional education in public archaeology is in great demand, by prospective students and by the archaeological community alike. This poses a challenge: how do we educate public archaeology professionals in this context? This presentation surveys the ways in which the term public archaeology is used within educational programs in the USA, and then uses the University of New Mexico's graduate program in Public Archaeology as an example of engaging with multiple definitions as a component of professional education.

343 HERITAGE, CULTURE, IDEOLOGY AND ARCHEOLOGICAL AESTHETICS DURING DICTATORIAL REGIMES IN EUROPE AND AMERICA

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Martín López, David (Department of Art History, University of Granada) - Chatzikonstantinou, Katerina (Department of Architecture, University of Thessaly)

Format: Regular session

Architectural and urban heritage memory has been important for dictatorships and authoritarian regimes in Europe and America during 20th century. It can be considered a cultural and political weapon to create a new ideology about their origins, roots, and meanings. In this sense, archaeological intervention has been fundamental in order to sustain the discourse of identity, race, inherent to a specific population regarding the difference of the "other". Nations and countries with these political atmospheres have changed their archeological sites aiming to reinforce the ideals of each regime.

In addition, the underlying roots to the history that can be perceived in an archaeological excavation and its associate museographic and urbanistic discourse, allow to understand the historical legacy at the same time than the ideology of the political regime. This session emphasizes the discourse and ideological imaginary of dictatorships and their use in archaeology, in their cultural history and in their architectural, urbanistic aesthetics and in the methods themselves to excavate and reflect the results obtained.

In particular, we would encourage works that explore the following topics:

- Explores distinct socio-political and economical circumstances that formed specific national tourism development policies with archaeological significance during European and American dictatorships.
- Offers an overview of the international relationship between heritage, archaeology and political ideology during the regimes of 20th century.

- Reviews archetype places where the heritage of the archaeological site is deeply connected with Fascism or Communism.
- Analyse how during Democracy those archaeological sites have been reconverted, readapted and resignified into new perspectives.
- Raises questions on the success or failure of the tourism strategic focus of the archaeological sites' policies during the dictatorships.

Papers that offer comparative perspectives, especially across nations, are especially desired.

ABSTRACTS

1 ARCHAEOLOGY IN RUSSIA DURING THE COMMUNIST AND DEMOCRATIC PERIODS

Author(s): Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Communist ideology, and claims that the country's resources belong to the 'people', became the basis for protecting archaeological monuments as Soviet 'national wealth'. The multinational USSR lacked a national ideology. All archaeological sites were seen as indicators of stages of societal development, in line with Marxist theory. Studies of Stone Age sites – an era which ideology claimed had no class divisions, just like the Medieval period – enjoyed great popularity.

The system of 'rescue archaeology' in the USSR took shape in the 1920s, within the norms of the Stalin regime. It was a period of intensive construction of a state energy program, and central focus on a planned economy. The main precepts were established, a need for compulsory excavation of sites destroyed during construction was established, and a procedure laid down for financing surveys. The authorities urged that 'conscious citizens' with an interest in history, as well as specialists, should enrol in identifying archaeological sites. Dozens of expeditions were conducted. They included Academy of Sciences, museums, universities. The Soviet state took complete responsibility for archaeological heritage – financing identification, creating registers, and protecting the archaeological legacy.

The system of conservation in the post-WW2 USSR worked at varying levels of efficiency. A database of sites was established for hitherto unsurveyed regions.

The first post-soviet decades, and the chaotic 1990s shift to democracy saw a meltdown in protection for Russian archaeological heritage. Economic and political crisis became the backdrop for decline in research levels. Transfer of land to private hands prompted difficulties in protecting and preserving archaeological sites.

In the recent decades which followed ratification of the La Valletta Convention in Russia, new legislation has appeared governing archaeological heritage, enabling its protection within Russia.

2 THE PROBLEMS WITH MARXIST APPROACHES IN ARCHAEOLOGY: AN EXAMPLE OF ARCHAEOLOGICAL THOUGHT IN SOVIET OCCUPIED LATVIA (1940-1941; 1944-1991)

Author(s): Broka-Lace, Zenta (Institute of Latvian History at the University of Latvia)

Presentation Format: Oral

During Soviet occupation Latvian archaeology, as well as other sciences and entire aspects of life were reorganised after the official ideology of the Soviet Union (USSR): Marxism–Leninism. The goal was to build the communism, but prior to that all preceding views about the past had to be revised and adjusted in order to fit the theory of evolution towards the "World communism".

Although it is widely agreed that history and prehistory were those spheres where ideology was just a formality, there is no doubt that archaeologists also had to contribute to the regime. Today it needs to be asked, whether we realise how much Marxism has affected and even distorted the science? Marxism still is seen as a legitimate scientific theory to be applied in research, but there are few discussions about the anachronistic and selective character of this approach towards the past realities.

By giving overview of the Latvian archaeological thought under the Soviet rule, in this paper I suggest that it is extremely important to understand and acknowledge the ideologies underlying our work, how much they can help explain our research material or lead us to erroneous assumptions and vague scientific compromises.

3 PALAST DER REPUBLIK: AN URBAN LANDMARK AS CONTESTED CULTURAL HERITAGE

Author(s): Chatzikonstantinou, Katerina (University of Thessaly)

Presentation Format: Oral

The Palast der Republik (Palace of the Republic, 1973-1979), a fiercely rectilinear, bronze-clad edifice in the heart of East Berlin, was standing in defiance to the 19th century urban etiquette until its demolition in 2008. The building, typical of its time, modern and socialist, was considered variously as an urban aberration, or else as a testimony to a post World War Two 'Brave New [socialist] World'.

Intense debate was caused among the local population and the political world upon the state's decision for the Palast der Republik's demolition and its replacement, starting in 2013, with the Humboldt Forum museum, a building with three of its sides being exact replicas of the original mid 16th century Berlin Palace/ Stadtschloss that once stood in the same location.

The Palast der Republik represents the old division of the city and created a new division within the city, posing the question of the type of political identity we are seeking for our cities and the way in which it is informed by the urban heritage and specific monuments of the city.

The research wishes to offer a discussion on the monument's identity and its role as a landmark in the redefinition of public space in the center of unified Berlin, as filtered in the construction of the new monument-to-be of the Humboldt Forum museum; the importance of the particular site within the institutional order of the city – both the divided and the reunited one; the tension between the historical legacy and ideological imaginary attached to the original Berlin Palace and the Palast der Republik as a place for the people and as a place of power.

4 **AESTHETICS OF FASCISM – MOTIVES OF THE PAST IN FASCIST URBANISM AS SEEN IN THE MINING COLONY OF RAŠA**

Author(s): Lorber, Crtomir (University of Ljubljana)

Presentation Format: Oral

Dictatorial regimes often appropriate cultural heritage for propaganda purposes. This is a simple truth, which makes us forget, that their interpretations of cultural heritage evolved through the duration of the regime. This is the fact with the ritualization of historical sites and with the integration of historical symbolism into their iconographic language. Material culture is an incarnation of societies. As such the imitation of older civilizations, most notably the Romans, by the Italian fascists, represents a vision of themselves in their ideal future.

This self-aggrandizement is the driving force behind the interest fascism displays in archaeology. It drives the fascists to integrate the “glorious” past into their world. This was done in many ways. The most direct was the integration of archaeological sites into propaganda; another was the imitation of the past, which can be seen in fascist urbanism and colonialism. We propose to analyse the fascist urban heritage as an imitation and appropriation of the past, where urbanism and its’ aesthetics represent an archaeological monument.

A suitable example is the mining colony of Raša in Istria, a part of a much bigger project of regional bonification, civilizing the fringes of the Italian state similar to the way the regime saw the Romans as the bringers of civilization. We intend to analyse how the appropriation of the past informed the construction of this colony, how it was integrated into the fascist imaginary system and how it was intended to reinforce the ideals of the regime in the material world, how it became an archetype of fascist colonialism. We intend to analyse how Raša lived and lives on, through the socialist Yugoslavia and today in Croatia, how it was re-imagined to the new historical environment and what its’ perspectives as an example of a historical urban environment are.

5 **MUSSOLINI AND THE EVOLUTION OF ITALIAN CULTURAL HERITAGE LEGAL DEVELOPMENT: A PARADOX**

Author(s): Karabaich, Kassandra (Independent)

Presentation Format: Oral

By and large, cultural heritage laws developed in greater strength and numbers during the second half of the twentieth century – due in no small part to the 1954 Hague Convention – even though key players in European politics such as France, Spain and Belgium had developed legal systems and well documented concern for the health of the national arts.

Italian legal development, however, was ahead of its time concerning such matters with legal policies put in place to enforce cultural preservation policies as early as 1907 (no. 386) – which set Superintendencies in place – and was further strengthened with the establishment of policies regarding antiquities, fine arts and conservation codes in 1909 (no. 364).

Crucially, the most effective legal cultural policies were developed in Italy during the 20th century under the dictatorship of Benito Mussolini. Superintendencies increased in great number and specific function in 1923 and were later corrected by the even more influential law no. 1089 in June of 1939, which, most crucially, took into account the commonalities between the protection of cultural heritage and the advancement of the public good and private interests.

I would like to propose an overview of the ways in which the implementation of cultural heritage legal policies under Mussolini both complemented his wish to incite nationalistic ideologies under his regime as well as how these policies were formulated to simultaneously allow the destruction of choice cultural heritage in the name of the new Fascist state. This Italian case study is even more interesting given its stark contrast in legal heritage development in comparison to its allies during WWII. In doing so, the discussion will also serve as a necessary asterisk that highlights the law’s role in larger questions regarding how cultural heritage management can both prevent and contribute to political regimes.

6 **THE POWER OF THE SYMBOLS AND THE ROOTS OF THE FASCIST FETISHIZATION OF ROMAN ANTIQUITY**

Author(s): Fadda, Salvatore (Università degli Studi di Sassari)

Presentation Format: Oral

The relationship between the Italian fascist regime and Roman archeology is based on an extreme simplification of antiquity, reduced to a mere set of aesthetic motifs used in virtue of their symbolic power. On the images of ancient Rome, the regime established a cult of Romanity that was one of the fundamental elements of its propaganda.

The use of Romanity as a propaganda tool was not, however, an invention of fascism, this cultural process had been started in

the decades immediately following the completion of the unification of Italy by the official organs of the former Savoyard state. In fact, once the Italian state had been built, the problem was to give the nation a cultural form and a unitary heritage.

The young state needed an imaginary model of reference for its community; a common historical denominator was needed to justify the existence of a nation which until then had been perceived as extremely varied. In the wake of the Risorgimento movements that were pursuing a patriotic awakening even through a rediscovery of antiquity, the official culture of post-unification Italy showed a renewed interest in Romanity.

Roman archeology and its images were one of the most effective tools used by official culture to provide the new nation with a common past, forging it from an imagined community. In the degeneration of this nationalistic cultural movement we can recognize the themes underlying the fetishization and the distortion of the Romanity occurred in Mussolini's Italy, perceptible very clearly in the aesthetics and in the whole communication system of the fascist state.

7 ANTHROPOLOGY AND THE MARCOS REGIME: COMPLICIT POSTCOLONIAL KNOWLEDGE DURING THE COLD WAR BETWEEN THE PHILIPPINES AND THE UNITED STATES

Author(s): Wirth, Christa (University of Agder)

Presentation Format: Oral

Members of the Chicago School of Philippine Studies provided the dictator Ferdinand Marcos in the Philippines with the intellectual and institutional foundation on which he would build his New Society and establish his authoritarian rule, as I will argue in this paper. Marcos who declared martial law in 1972, tied the heritage of his New Society to a time, which was untouched by the Spanish and the U.S. colonial regimes. This precolonial New Society knowledge relied on archaeological excavations, anthropological research, and institutional support that the star students of both Philippine and U.S. heritage who had graduated from the University of Chicago provided Ferdinand Marcos with. The Chicago graduates occupied key positions within the academy and in the National Museum of Anthropology of the Philippines. In this paper, I will thus ponder the following questions: In what way did these archaeologists and anthropologists biographically, institutionally and scientifically become entangled with the U.S.-backed Marcos regime? How were they complicit? This paper – although focusing on an Asian dictator not an American or European one – will locate itself within this session by showing how archaeology and anthropology became the central spaces that were shaped against a Cold War/Postcolonial backdrop. I will argue that Cold War money, U.S. anxieties about communism in Asia, and neocolonial continuities created an archaeology that catered to the needs of a dictator.

344 STUMBLING BLOCK OR COMMON GROUND? THE QUESTION OF STANDARDISATION OF PALAEOLITHIC AND MESOLITHIC LITHIC ANALYSIS

Theme: Archaeological theory and methods beyond paradigms

Organisers: Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266) - Arrizabalaga, Alvaro (Research Group in Prehistory - IT-622-13, University of the Basque Country - UPV/EHU) - Groß, Daniel (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266)

Format: Discussion session with presentations of max. 6 min. and slides

Lithic material represents the dominant part of the Palaeolithic and Mesolithic archaeological record. Hence, lithic studies are an essential tool for analysing this record. Over the last one and a half centuries different approaches to lithic studies have developed, often reflecting political, regional, and linguistic divisions. Consequently, approaches to lithic studies with different foci, methods, terminologies, and paradigms have co-existed for decades. With the development of computer-based analytical techniques, calls for greater comparability of data across larger areas and longer time periods grow louder. For this to be feasible, lithic studies need to become standardised in data collection methods and terminology.

But is this standardisation possible? Is it actually desirable? What are the advantages and disadvantages of diverse methodologies and research traditions? What might a standardised methodology and terminology of lithic analysis look like? What are the differences between the lithic studies of the Lower, Middle, Upper, Final Palaeolithic, and the Mesolithic? Where are the commonalities across the different national and regional research traditions?

In this discussion session, we want to identify areas of common ground and stumbling blocks in lithic studies and discuss the different possible scales of standardisation.

ABSTRACTS

1 EXPERIENCES OF ANALYSING MIDDLE PALAEOLITHIC/MSA-LSA ASSEMBLAGES AND SYNTHESISING TYPOLOGIES IN SOUTH WEST ASIA AND EAST AFRICA

Author(s): Blinkhorn, James (Department of Geography, Royal Holloway, University of London)

Presentation Format: Oral

Stone artefact typologies remain a key component of lithic studies, typically combined with studies of the chaîne opératoire or organisation of technology in modern analytical approaches. The use of these latter approaches can offer a more detail on stone reduction practices from the past than typological approaches alone, as well as avoiding implicit functional assumptions

of some stone tool types or the impact of reduction intensity on the form of discarded stone tools. However, their application is time consuming and a range of practical issues from accessing collections and curation practices up to priorities of funding bodies can limit their use on historic lithic assemblages. In contrast, typologies have been widely employed throughout the history of Palaeolithic research, but offer more limited detail on past behaviour. While synthesising typological terminologies used by different analysts presents problems, devising methods for integrating historic and modern typological datasets offers the means to explore lower resolution patterns of behavioural change at larger geographic and temporal scales. Here, I hope to set out the methods I've employed in synthesising Palaeolithic datasets in South-West Asia and East Africa to open them up to quantitative analysis, and the extent to which they can inform (and be informed by) more detailed, site focused attribute analyses from both regions.

2 TYPOLOGY REDUX

Author(s): Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Oral

Lithic typology has been widely disparaged in recent decades in the study of the Upper Palaeolithic, as critiques concerning the reliability and theoretical underpinnings of the approach have found broad acceptance. However, lithic typology remains a key method for assemblage comparison, especially when comparing a large number of sites or carrying out preliminary analyses. Furthermore, it is arguably more amenable to standardisation than complex technological approaches. Here, I advocate for the importance of typology in Upper Palaeolithic lithic analysis and discuss how we can standardise methods in order to support inter-regional comparisons. I outline some key elements that are necessary for robust, replicable and useful typological studies. These include, for example, a revisionist approach to previous identifications, careful definition of technological and morphological features used to describe lithic artefact types, and full sharing of data. A critical understanding of the historical development of particular lithic type definitions is also important.

3 REBUILDING THE LITHIC HOUSE OF CARDS: LESSONS FROM THE MESO-LITHICS PROJECT & THE OPPORTUNITIES FOR THE STANDARDISATION OF LITHIC ANALYSES

Author(s): Preston, Paul (Lithoscapes Archaeological Research Foundation)

Presentation Format: Oral

Theoretically and methodologically British Late-Glacial Palaeolithic and Mesolithic research has been hampered by competing, incompatible, unsystematic, undefined, and non-technological lithic methodologies. Thus, failing to provide the fundamental purpose of artefact or period taxonomies: namely a common conceptual vocabulary and replicable analytical categories. These issues, in turn, inhibit the usefulness of lithic studies through miscommunication, circular debates, non-replication, the negation of inter-assemblage comparisons, preventing consensus period definitions, as well as the inability to assess technological, geographic, and chronological variation with universal clarity. The MESO-lithics project has begun to work towards a data-based, tested, and replicable modular analytical research framework for the Late-Glacial Palaeolithic and Mesolithic research. This Analytical Lithics Module methodology integrates an explicitly defined artefact taxonomy, technological attributes, and the protocols and theoretical concepts to apply them. Accordingly, based on the experiences of this project, this paper systematically outlines best practice, potential practical and theoretical issues in yielding and testing a standardised system that is both forwards and backwards compatible. By example, it showcases a meta-analysis of the methodologies used in Britain and recommends a new research framework that will facilitate a consensus and standardised lithics methodology. It then describes ways to overcome issues including project management through the GIT and methods developed for software development, consilience-based testing (through various technological attributes and geometric morphometric analyses in parallel with statistical and more novel analyses), and data-based updates to yield new standards (e.g. like IntCal).

4 SO IT SEEMS WE'RE ALL AGITATED! WHY "WE TRIED IT AND IT DOESN'T WORK" DOESN'T WORK

Author(s): Groß, Daniel (Centre For Baltic And Scandinavian Archaeology - ZBSA; CRC 1266: Scales of Transformation)

Presentation Format: Oral

While different materials from prehistory are getting increasing attention, large amounts of Late Palaeolithic and Mesolithic artefacts are still comprised of lithic artefacts. Since this is largely due to reasons of preservation, many sites are only known from surface finds and especially those with extensive artefact spectra are recorded in heritage databases. However, such sites often comprise multi-phased campsites or palimpsests, alas they are often heavily deteriorated due to e.g. ploughing which surfaced the artefacts. Even though their scientific and interpretational value is generally of minor importance, if settlement structures are in focus, they are still providing relevant information on the distribution of camps and can inform about the use and change of landscapes.

However, studies that want to analyse overarching patterns ironically often only work in restricted areas which is commonly due to different artefact taxonomies or typologies. While it is of course possible to translate between typologies if, for instance, the finds are displayed or formally described, quantitative and explorative analyses are often subject to an initial data homogenization. In this contribution I want to address some short-comings of current archaeological research from a typological and practical perspective. I will argue that even though a lot of time (and hence money) was spent to acquire data that is of hardly any use in its current form. This contribution will argue that homogenization is utterly necessary and, if tried always subject to

346 **KNOTTING, TWISTING AND PLAITING: LOOKING FOR DIRECT AND INDIRECT ARCHAEOLOGICAL EVIDENCES**

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Martin Seijo, Maria (Universidade de Santiago de Compostela) - Piqué i Huerta, Raquel (Universitat Autònoma de Barcelona) - Ciampagna, María Laura (Consejo Nacional de Investigaciones Científicas y Técnicas-CONICET)

Format: Regular session

Gestures such as knotting, twisting and plaiting were involved in the oldest processes of crafting plants; and were also crucial for turning plant (and animal) fibres into ropes, nets, mats and baskets among others. As other plant-based crafts this kind of objects have been usually perished and their evidences rarely survived in archaeological contexts, despite they developed essential roles in the day-to-day activities such as storing, carrying and fastening, in domestic activities or even in activities such as firewood procurement, gathering, hunting or fishing. Their poorly preservation in the archaeological record stresses the urgency of discussing about this kind of crafts. This session welcomes contributions dealing with direct and indirect archaeological evidence of knotting, twisting and plaiting, the technological know-how associated to fibre-crafting, the social and gender dimension of crafting plants, and especially those presenting combined evidences, multidisciplinary or ethnoarchaeological approaches. This session is organised in conjunction with the PlantWild Community of EAA.

ABSTRACTS

1 **A STUDY OF CORDAGE RECOVERED FROM CUEVA EPULLÁN CHICA (PATAGONIA, ARGENTINA): POSTHARVEST PRACTICES FROM HUNTER-GATHERERS AT LATE HOLOCENE TIMES**

Author(s): Ciampagna, María (CONICET, División Arqueología, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata) - Guillermo, Ailín (GEA, Facultad de Ingeniería, Universidad Nacional de Buenos Aires) - Mange, Emiliano (CONICET, División Arqueología, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata) - Crivelli, Eduardo (Academia Nacional de Ciencias de Buenos Aires y Centro de Investigaciones en Antropología Filosófica y Cultural - CIAFIC, Ciudad Autónoma de Buenos Aires) - Fernández, Fernando (CONICET, Cátedra de Anatomía Comparada, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata & GEA, Facultad de Ingeniería, Universidad Nacional de Buenos Aires) - Capparelli, Aylén (CONICET, División Arqueología, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata)

Presentation Format: Oral

Basketry and cordage remains are scarcely recovered in archaeological sites of Argentinian Patagonia, probably because of the poor preservation potential of this kind of plant material. In this context, cordage preserved in an archaeological site of north Patagonia is relevant. The aim of this communication is to present the taxonomical identification of twenty two desiccated pieces of cordage of Cueva Epullán Chica cave -ECh- (Collón Curá Department, Neuquén, Argentina). ECh is an archaeological site in a small cave with rock art, located in the middle Limay River valley. The characteristic vegetation of the area corresponds to the Monte-Patagonia ecotone. In successive field season between 1989 and 1992, human, faunal, lithic and vegetal remains were recovered in stratigraphic position. Based on radiocarbon dates, four periods of occupation were defined from 2200 years BP until the 20th century. The archaeological record shows general uniformity throughout the sequence. A subsample of 84 macro-remains -inflorescences, fruits, seeds, leaves, woods- of the late period of occupation (1500 years BP to the 20th century) was studied in a previous project. Among the identified taxa are: *Larrea* sp., *Schinus* sp., *Adesmia* sp., *Ephedra* sp., *Colliguaja integerrima* and aff. *Chuquiraga erinaceae*. In this presentation, histological sections of cordage were observed with stereoscopic and optical microscope and compared with herbarium material from the Monte and the Patagonian steppe. Some taxa, such as *Juncus* sp., were employed for manufacturing cordage. Attributes and features of this technology are described. These results were compared with basketry from Epullán Grande cave, distant 100 m from ECh. Based in these results, the harvesting and postharvest practices concerning plants and manufacture techniques are discussed.

2 **TWISTED FIBRE AND POTTERY: A CLOSER LOOK AT CORD STAMP DECORATION IN THE EAST BALTIC**

Author(s): Berzins, Valdis (University of Latvia, Institute of Latvian History; Centre for Baltic and Scandinavian Archaeology)

Presentation Format: Oral

Imprints of cords and knots are prominent in the decoration of particular ceramic wares, including pottery made by hunters and fishers in the early prehistory of Northern Europe. In this context there is an obvious but hitherto little-explored link to the fibre technologies employed in making equipment for catching and gathering food from the wild. This paper looks at the imprints made in pottery using a tool wound with cord, known as "cord stamp" or "wound cord" – an impressed decoration technique commonly represented in the early pottery of the East Baltic region and other areas. The main focus is on this mode of ornamentation as used on pottery from the Rīņņukalns shell midden of the 4th millennium BC in northern Latvia, which is examined from a technological perspective and discussed in relation to the remains of cordage from the same period in the East Baltic. The study employs microscopy and image processing to reveal technologically diagnostic features of the decoration.

3 BASKETRY EVIDENCE IN THE EARLY NEOLITHIC SITE OF LA DRAGA (SPAIN)

Author(s): Piqué, Raque- Romero Bragues, Susana (Departament de Prehistòria, Universitat Autònoma de Barcelona)

Presentation Format: Oral

Basketry has solved several needs in preindustrial societies. This craft, widely spread in all the world, has been used to produce containers for a great diversity of purposes: storing, cooking or serving food, as well as other finalities like sieving for example. Despite the importance of basketry in modern societies, their preservation in European prehistoric sites is limited, and, as a consequence, the knowledge about the origins of the techniques used, raw materials, and morphologies as well as its geographical and chronological distribution is scarce.

Waterlogged sites are one of the main contexts where baskets are preserved, providing an incomparable frame to study of this craft and its social and economic implications. This paper presents the basket remains recovered at the early Neolithic site of La Draga (7300-7000 cal BC). The site has provided a singular sample of basketry corresponding to the first farming communities settled in the Northeast of Iberian Peninsula. The interrelation between materials, techniques of manufacture and the potential function are evaluated.

4 WEAVING THE WILD: DIRECT AND INDIRECT EVIDENCES OF IRON AGE BASKETRY IN NORTHWEST IBERIA

Author(s): Martin Seijo, Maria (Universidade de Santiago de Compostela)

Presentation Format: Oral

Evidences related to basketry technology are rather frequent at Iron Age contexts of Northwest Iberia and was probably crucial in the day-to-day life of these communities. Basketry technology was used for making wattle-hurdles, mats for floor and bedding and different kind of containers. Direct evidences of hurdles and baskets such as charred wood remains -including twigs and wood strips- have been recovered from contexts related to fire events (e.g. Castrovite, Monte do Castro, Nabás, etc.). *Corylus*, *Alnus* and *Salix/Populus* amongst other taxa have been identified in relation to this kind of objects and structures providing information about how this communities managed the wild through silvicultural practices. Whilst their main indirect evidences include impressions in clay of wattle hurdles and baskets and the representation of mats or other objects that have been carved in stone sculptures. There have been also summarised the toolmarks and tools related to basket-making that have been identified in Iron Age contexts. Current ethnobotanical data and experiences accumulated by crafters of this geographical area provide also information about the seasonality of tasks performed by basket-makers or even about the existence of gender bias in basket-making.

5 MIDDLE AGES IS FULL OF ESPARTO: LAS PALERAS FORTIFIED SITE AND ITS CIRCLE OF PRODUCTION (8TH-10TH CENTURIES AD)

Author(s): Celma Martínez, Mireia (University of Murcia) - Baños Serrano, José (Department of Culture and Heritage, City of Alhama de Murcia) - Stika, Hans-Peter (University of Hohenheim) - Ruiz de Torres Moustaka, Ioanna (Institute of Cultural Heritage of Spain) - Monteagudo Merlos, Josefina (Department of Culture and Heritage, City of Alhama de Murcia)

Presentation Format: Oral

Las Paleras archaeological site has confirmed the finding of a fortified settlement from 'Cora de Tudmir' in Sharq al-Andalus, which dates back to early Middle Ages (8th-10th centuries AD). Its brief existence is directly related to the numerous and abrupt political and social changes that occurred in the territory of al-Andalus during the Emiral period. The documented urbanism presents distinct zones with a complex distribution. The sudden abandonment of the site was due to a generalized fire level identified, and no other settlements were founded after this episode.

This settlement has undergone an exhaustive process of recovery and analysis of archaeobotanical remains for almost ten years. The well-preserved refilled layers in the silos, consumption inside de houses and the wooden roofings led the research team the determination of a vast range of wild and domesticated plants like cereals, pulses, fruits, oilseeds, firewood and beams. Charcoal and carpological analyses have documented more than 29 taxa, but this study focuses on *Stipa tenacissima* taxon.

These remains use to be poorly preserved but the fire action and decomposed masonry covered charred objects of esparto grass. In order to recover these objects, it was necessary to carry out in-situ conservation with a micro-excavation, parallel to the pre-treatment, subsequent extraction and transfer to the laboratory for ultimate consolidation. In almost all the floated sediment samples, esparto grass was recovered, meaning the economic importance and versatile objects production. The results have been remarkable for the knowledge of twisting and plaiting processes for mat and basket production, where ethnology and gender perspective are taken into account.

The City of Alhama de Murcia is the promoter of historical research and archaeological work in Las Paleras, through Los Baños Archaeological Museum. The archaeobotanical research counts on the University of Murcia (Spain) and University of Hohenheim (Germany) essential contribution.

6 TWISTING, KNOTTING, FOLDING OR BRAIDING VEGETAL CORDS AND STRIPS FOR POTTERY MAKING: RESULTS FROM AN ETHNO-ARCHAEOLOGICAL RESEARCH IN MALI

Author(s): Mayor, Anne (Laboratoire Archéologie et peuplement de l'Afrique, Unité d'anthropologie)

Presentation Format: Oral

While direct evidence of objects made of plants is rare in archaeology outside particular conservation contexts, it is possible to approach them indirectly when they leave their mark on a support that has preserved, such as pottery.

In sub-Saharan West Africa, various types of basketry and nets have been used to shape pottery, and have left their imprint. In addition, many different vegetable roulettes, based on twisted, braided or knotted cords, and folded or braided strips, have been manufactured for several millennia to decorate the body surfaces of ceramics.

Some of these tools are still present today. An ethno-archaeological study conducted in several ethnic groups in Mali revealed their technical and socio-cultural significance.

Important work has also been done on issues of identification and terminological homogenization. The publication of a bilingual textbook is now bearing fruit by making it easier to compare ceramic assemblages of archaeological sites from different regions and periods, studied by archaeologists from different research traditions.

Despite their minor part in the material culture made up of plant elements, these potters' tools show the great diversity of techniques known and implemented, and their importance in the definition of identity for numerous cultural groups. This makes it possible to imagine what it could have been like with all the missing perishable objects.

A. THE CORD-IMPRESSED ORNAMENTATION ON CERAMIC VESSELS

Author(s): Chikunova, Irina (Tyumen scientific center SB RAS)

Presentation Format: Poster

Clay, metal, bone and stone items represent the most evident traces of the human activity in the Iron Age and Middle Ages in Western Siberia. Referring to some tools, we can assume that they were used for processing of organic materials such as leather, plant fibers and wool which unfortunately have not been preserved.

However, there is an evidence which proves the existence of developed thread braiding, wool spinning and weaving skills. Occasionally it is possible to encounter imprints of fabrics or woven floor mats made of plant fibers on the ceramic vessels of different historical periods. Preserved due to a proximal location to metal items, fragments of textile can sometimes be found in graves.

Ornaments on the pottery of the Kashino culture (Western Siberia, the Tobol river valley, the early Iron Age) were made by cord impressions. Usually the upper part of a ceramic vessel was decorated with a cord impression. The border ornament was a characteristic feature. It was composed of 2-4 horizontal line impressions, and zigzag signs, round brackets, crosses, and columnar shapes were placed in-between. The irregularity of the cord is clearly visible in its impressions. The cord or the wisp consisted of 5-7 threads or fibers. Threads were made of coarse wool or plant fibers (nettle or cannabis). The cords differed in thickness, density and twisting method (S or Z). The plant fiber cord impressions were usually deeper and had sharp margins.

Furthermore, the tradition of the cord-impressed decoration of ceramic vessels had also been preserved in the materials of the Yudino culture which was localized in this territory during the Middle Ages.

347 FOOD ECONOMY AND FOODWAYS OF JEWS AND MUSLIMS THROUGH THE AGES – ARCHAEOLOGICAL INSIGHTS

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Lisowski, Mik (University of Sheffield) - Grau-Sologestoa, Idoia (University of Basel) - Aniceti, Veronica (University of Sheffield)

Format: Regular session

Food economy and foodways of religious communities are rarely in the main focus of research in archaeology and zooarchaeology. The main reasons behind this are simple: the paucity of the available archaeological data, and the difficulty of attributing archaeological record to particular religious groups. These problems have been addressed by a number of case studies published in recent years, which showed the potential of archaeology in identifying the presence of Jews and Muslims in the past, and have contributed to a growing body of evidence. These studies, however, have mostly been site-specific, and little attention has been placed on large-scale analysis of development and changes in the foodways of Jews and Muslims. This session aims to address this issue, bringing together and summarising research from a wide array of archaeological contexts.

We welcome contributions focusing on food economy and foodways within two main themes. The first one is concerned with food-related interactions between Jews and Muslims or with their Christian neighbours. This may include the analysis of the quality of animals (size, sex, and age) or meat (specific cuts) traded between local religious majorities and minorities, which may provide information on the disproportion of power and the relationship of these groups. The second theme concerns regional changes, developments, and differences in foodways within Jewish and Muslim communities. This includes local status and wealth of particular Jewish or Muslim households, evolution of kosher and halal foodways, and local food-related traditions in different countries based on species and body part representation, butchery patterns, supported by material culture and literary sources.

The session is open to papers using animal remains and/or material culture from Jewish and Muslim archaeological sites of domestic nature from different chronological periods.

ABSTRACTS

- 1 AN OVERVIEW OF PORK CONSUMPTION IN EARLY JEWISH, MUSLIM AND CHRISTIAN COMMUNITIES IN THE SOUTHERN LEVANT**
Author(s): Horwitz, Liora (The Hebrew University of Jerusalem)
Presentation Format: Oral

It is generally accepted that the choice of foods that we eat, how we prepare them and how we eat them, are a reflection of our ethnic identity. An even more compelling ethnic signature are the foods that are excluded and are taboo to communities worldwide. The taboo that has probably received the most academic attention is the prohibition on the consumption of pork for Jews and Muslims, a practice that is based on religious codes, and is a feature which sets these communities apart from others.

The reasons for this taboo are still debated and although relevant, will not be explored in this paper which will focus on whether we can determine when such a distinction first became apparent in the archaeological record of the southern Levant (the region spanning southern Syria, Israel, the Palestinian Authority and Jordan). It then tracks how pork consumption manifested itself during the Persian, Roman and Byzantine periods with the rise of pagan and Christian communities in the region, and finally, what happened with the arrival of early Islam ca. 638 AD. This overview will be based on numerous published archaeozoological assemblages from sites in the southern Levant. The discussion of this data set is inexorably entwined with the question - of whether archaeozoological data by itself can serve as a reliable tool for assessing ethnic identity in past communities.
- 2 FOODWAYS OF JEWISH COMMUNITIES IN THE LATE- AND POST-MEDIEVAL CENTRAL EUROPE**
Author(s): Lisowski, Mik (University of Sheffield)
Presentation Format: Oral

The relationship between Jews and Christians in the late- and post-medieval Central Europe has always been a complex one. Historical texts provide much of the known information about the coexistence of the two communities; however, they often lack geographical resolution and leave regional blank spots. This paper tackles this issue from a zooarchaeological perspective, by investigating the foodways and meat trade between Jews and Christians.

The paper presents a few case-studies of zooarchaeological analysis of data from Jewish archaeological sites from Polish, Silesian, and Bohemian cities and towns. The sites represent rural producer and urban consumer sites, allowing for an investigation of the relationships between those two types of sites, patterns of husbandry and animal products available to urban consumers. The analysis of species and body parts has provided information about food preferences and wealth of the communities. Comparisons between Jewish and Christian sites revealed how the trade of non-kosher meat was shaped by the relationships between the Jews and their Christian neighbours. Finally, the biometrical data have demonstrated the difference of the quality of animals that were used to supply the two communities.
- 3 "OF THE HOUSE OF ISRAEL IN AMERICA": ZOOARCHAEOLOGICAL APPROACHES TO 19TH CENTURY ASHKENAZIC JEWISH FOLK RELIGION IN THE DIASPORA**
Author(s): Markus, David (Clemson University)
Presentation Format: Oral

The family of Abraham and Fanny Block represent the earliest documented Jewish immigrants to Arkansas in the United States, arriving from Bohemia by way of Virginia in 1827. Isolation from the Jewish religious infrastructure they were accustomed to in Europe meant the Blocks had to make concessions regarding their religious practices. Archaeological investigation at their family home in Washington, Arkansas since the 1980s has produced no overt evidence of a Jewish religious practices in the household. However, while the family's Jewish identity was pushed to the margins they may have taken subtle means of adapting their faith to life on the American frontier. Faunal remains recovered from the in the form of an articulated chicken burial and two kitchen and food waste middens support the idea that Ashkenazic folk religious practices were being undertaken in the household in a way that avoided religious persecution and social ostracization from their non-Jewish neighbors. This zooarchaeological evidence provides the framework for understanding folk traditions such as the koshering of kitchen vessels and the atonement ritual of Kapparot as a means of remaining connected to the broader Jewish Diaspora while living outside of Jewish community in Europe.
- 4 DINING UNDER THE CRESCENT MOON: ZOOARCHAEOLOGICAL INSIGHTS INTO THE PROCESS OF ISLAMISATION IN IBERIA (8TH-10TH CENTURIES)**
Author(s): Garcia, Marcos (University of York; University of Granada)
Presentation Format: Oral

The Islamic conquest of the Iberian Peninsula was a far-reaching process that implied the transformation of the previous sociocultural, economic and political structures. From the 711 AD, the former Hispania, known from that point on as al-Andalus,

became part of a wider Islamic cultural and religious *koiné* that encompassed North Africa, the Levant and far beyond. By being incorporated into the Islamic world, Iberia became exposed to new culinary influences and it seems possible that their uptake was accompanied by different techniques of food preparation and cooking.

The aim of this paper is to offer insights into the historical dynamic of the emerging period of al-Andalus through the assessment of the patterns of animal-based food consumption observed in a set of zooarchaeological assemblages dated between the 8th and the 10th centuries AD. The approach adopted emphasises the social and cultural significance of foodways, highlighting the relevance of the patterns observed for addressing the analysis of the process of Islamisation, conceived as the most powerful engine of social transformation in Iberia during the early medieval period.

5 FROM MADĪNA MAYŪRQA TO CIUTAT DE MALLORCA: THE SUPPLY OF ANIMAL PRODUCTS IN A MEDIEVAL CHANGING TOWN

Author(s): Valenzuela, Alejandro (University of Barcelona)

Presentation Format: Oral

Between the 10th and 15th centuries, the present-day port city of Palma (Mallorca, Balearic Islands) played a key role in the process of formation of different social, political and cultural communities who lived in the island. Within its walls, groups of different religious identity (i.e., Muslims, Jews and Christians) and socio-economic status (from slaves to social elites) shared an urban space that required the constant supply of food. It is expected that this food procurement was in accordance with the cuisine and foodway demands of the dominant social group for each period: the Muslims in the Islamic period (10th-13th) and the Christians in the Feudal period (13th-15th). Thus, these modes of acquisition and consumption should be recognizable in the archaeological record despite constraints imposed by other factors such as the mode of production and the insular environment from where those resources were extracted. This communication synthesises faunal data from medieval archaeological sites in Palma. The aim is to identify zooarchaeological evidence that can improve our understanding of socio-economic status and cultural identities of the dwellers that inhabited the town throughout its historical development. The main zooarchaeological indicators for social differentiation are explored: sex, age, size and meat cuts (taking into account different types of sites – high status residence versus industrial area), and different socio-political systems (Islamic and Christian periods), from a diachronic perspective.

6 A MORISCO GARBAGE DUMP IN THE NORTHERN OUTSKIRTS OF GRANADA (SPAIN). ISLAMIC MEAT CONSUMPTION PATTERNS AFTER THE CHRISTIAN CONQUEST

Author(s): Garcia-Contreras Ruiz, Guillermo (Universidad de Granada) - García García, Marcos (Universidad de Granada; University of York)

Presentation Format: Oral

Between 2013 and 2015, an archaeological research was carried out in connection with the redevelopment of the university campus of Cartuja in the northern outskirts of Granada. During the Middle Ages, this area was a rich agricultural area linked to irrigation systems, including farmhouses with high social level owner, some of them linked to the administration of the last Islamic Kingdom of Iberia. The surrender of Granada into the hands of the Catholic Monarchs (1492 AD) had an important impact in this area. With the construction of a Monastery under the Carthusian monks' control, the surrounding lands were gradually transformed, the structure of the plots changed, and the previous structures destroyed. In this context of transformations, c. 1516 AD a former water well was sealed and reused as a rubbish dump, throwing into it materials of construction, pottery fragments and faunal remains.

The aim of the paper is to present the results of the zooarchaeological analysis of this archaeofaunal assemblage, offering a glimpse into the production and distribution system of animal products during the early Modern Age in the core of the late Nasrid Kingdom of Granada. Furthermore, the patterns of meat consumption observed allows to suggest the maintenance of Islamic foodways –mainly characterised by the absence of *Sus* (pig/wild boar) remains– even when other aspects of the food system changed as the consequence of the Christian conquest. The case of study highlights the inextricable connection between socio-cultural identity and foodways during a period defined by profound transformations.

7 MEAT CONSUMPTION IN SICILY IN MUSLIM TIMES (9TH-11TH CENTURY AD)

Author(s): Aniceti, Veronica (University of Sheffield)

Presentation Format: Oral

In the 9th century AD, Sicily became a frontier of the Muslim world. The Arabs introduced several socio-cultural and economic changes, which also impacted on the dietary habits of the local Christian population. Food is often used as a means of ethnic differentiation between different religious communities, and faunal remains represent an invaluable tool to detect such culturally-driven food preferences. In the case of Muslim cultures, faunal assemblages are particularly useful to detect permanent dietary taboos.

This study investigates meat consumption in Muslim Sicily, with a special focus on the introduction and spread of Muslim food taboos, most famously that on pork. Faunal assemblages from urban and rural sites were analysed. Zooarchaeological results show that pork was almost banned from urban centres, where mutton was by far the preferred meat. Intriguing results emerged from the Sicilian countryside; here, pigs were raised and consumed during the Muslim period, in line with the previous Byzantine

and the following Norman phases. As a result, it seems that the well-known Muslim aversion to pork consumption was not applied at the same scale in the entire island, suggesting a less intensive cultural pressure in rural areas.

The presentation highlights the key role of zooarchaeology in detecting food taboos, and interpreting them within the wider archaeological and historical context.

8 DIET, ECONOMY AND STATUS OF MUSLIMS IN THE “VILLA DEL CASALE” OF PIAZZA ARMERINA (SICILY) BETWEEN X AND XII CENTURIES

Author(s): Scavone, Rossana (Università degli Studi di Verona)

Presentation Format: Oral

The current investigation concerns the study of animal bones, not analysed previously, from the “Villa del Casale” and its neighbouring medieval settlement (2004-2013 excavations). The aim of the project was to acquire information about the animal species that used to live in the proximity of the site, the purposes of their husbandry, economic activities, people’s diet, cooking, and waste disposal. Food is an expression of values and cultural choices; hence, another purpose was to observe the economic and food changes during the century in which the Villa was occupied.

The paper concerns, in particular, the animal bones from the pits in the area of the Villa and from the pits and the medieval layers of South Thermal Baths. The bones together with ceramics and other objects testify the most ancient phase of Islamic inhabitation and the life of the settlement in the late Islamic-early Norman period. The research examined in depth various aspects of economy and diet in several periods of the Villa’s life and how it was gradually changed. It allowed forming a hypothesis about the status and religion of its inhabitants: a wealthy and self-sufficient Islamic village that changed its status presumably in fear of the incoming conquerors.

9 INTEGRATED BIOMOLECULAR AND TRADITIONAL ARCHAEOLOGICAL APPROACHES FOR THE STUDY OF MATERIALS FROM MULTI-FAITH SITES IN MEDIEVAL SICILY

Author(s): Orecchioni, Paola (University of Rome Tor Vergata) - Lundy, Jasmine (University of York) - Meo, Antonino (University of Rome Tor Vergata) - Ughi, Alice (University of York)

Presentation Format: Oral

The purpose of Sicily in transition project is to reveal and explain the experience of Sicilian population during periods of regime change, between the 6th and 13th century AD. As a result of four major transitions, from Byzantine to Aghlabid to Fatimid to Norman to Swabian, Sicily would have experienced social-economic and religious changes.

This presentation aims to explore the question of Muslim diet and foodways in Sicily at this time. As these transitions and associated impacts are not uniform across Sicily, it is essential to approach this question on a large scale, to ensure we are considering all chronological and regional variabilities. We have taken a diachronic approach, to assess the introduction and different uses of ingredients that arrived in Sicily at the start of these transitions. We also aim to understand the interaction of different religious groups within the same site and time. Further to this, we want to compare the lifeways of people within a religious group living in entirely different settlements, both in Western and Eastern Sicily, such as rural and urban sites, coastal and inland sites. Results have been obtained through a multi-disciplinary approach using isotopic analysis of human and animal bones and organic residue analysis of cooking pot, together with an in-depth analysis of pottery form and function.

10 CHANGING DIETS IN MOROCCO: LATE ROMAN, BERBER AND EARLY ISLAMIC FAUNAL REMAINS FROM VOLUBILIS

Author(s): King, Anthony (University of Winchester)

Presentation Format: Oral

Excavations at Volubilis, 2000-05, have shown that after Roman official withdrawal in the late 3rd century CE, an elite Roman way of life continued to the 5th century, until destruction by an earthquake. After this, the main centre of the town moved down slope towards the river, and in the 6th century a Berber enclave was established. This was followed in the 8th century by the headquarters of Idris I, a descendant of Mohammad, who founded the Idrisid dynasty in the region. Faunal remains from the excavations indicate a cattle-dominated pattern of animal husbandry and meat diet in the late Roman period, with both sheep/goat and pig also present in reasonable numbers. The Berber phase sees a diminution in pig percentages, and in the early Islamic headquarters area the diet is dominated by sheep/goat, with very low cattle numbers and virtual absence of pig. These changes at Volubilis itself may reflect a more widespread and relatively rapid adjustment of the regional animal economy away from a mixed cattle-dominated regime to one much more focussed on sheep and goats.

11 ANIMAL SUBSISTENCE IN THE ARID AREAS OF SYRIA AT THE BEGINNING OF ISLAM

Author(s): Studer, Jacqueline (Natural History Museum of Geneva)

Presentation Format: Oral

In the 8th and 9th centuries A.D., new settlements, even new cities, emerged in the arid areas of Syria. This is the case of Qasr al-Hayr al-Sharqi, a site located halfway between Palmyra and the Euphrates. The over 12,000 animal bone remains studied come from several mudbrick houses and buildings that testify to the exploitation of animals and the meat diet of the inhabitants. A total of 41 vertebrate species were identified but only 18 were consumed. While the diet is based primarily on sheep and goat

meat, there is evidence that camel, cattle and donkey were also consumed. In addition, hunting and trapping of wild game was practiced and there is evidence for imported foods. This paper will discuss whether species representation (such as the absence of pig remains) and the pattern of butchery (species patterning, cut mark type and location) that may offer any unique identifiers for this early Islamic community.

12 EATING MEAT IN MONGOL CITIES OF GOLDEN HORDE: ZOOARCHAEOLOGY OF THE SETTLEMENTS FROM OLD ORHEI AND COSTEȘTI (REPUBLIC OF MOLDOVA)

Author(s): Bejenaru, Luminita (Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Romania; “Olga Necrasov” Center of Anthropological Research, Romanian Academy – Iași Branch) - Stanc, Margareta Simina (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Bacumenco-Pîrnău, Ludmila (Institute of Archaeology, Romanian Academy – Iași Branch, Iași; Institute of Cultural Heritage, Chișinău) - Vornic, Vlad (National Archaeological Agency, Chișinău)

Presentation Format: Oral

Conversion to Islam of the Mongols in the Golden Horde Empire was achieved during the reign of khan Özbäg (1313-1342), and when the Mongol cities of Old Orhei and Costești existed (14th century), Islam was already practiced at the official state level. Archaeological evidences in this regard are numerous and conclusive: religious buildings (mosque), coins, funeral inscriptions, toiletries (bronze mirrors) with Arabic inscriptions, etc.

The Golden Horde domination in the area east from the Carpathians represents the western periphery of the Mongol Empire and it benefited by “the Mongol peace” starting with the first quarter of the 14th century, until the seventh decade of the same century.

This study brings together and summaries zooarchaeological research from two archaeological contexts: the Mongol urban sites of Old Orhei and Costești, both situated in Republic of Moldova.

Animal remains are described in terms of their frequency, quality (size, age and sex), and food-related traditions based on species, body part representation, and butchery patterns.

In the period of Mongolian occupation (Golden Horde) of the two settlements, the main animal species used in the food economy were sheep/goat (*Ovis aries/Capra hircus*), cattle (*Bos taurus*) and horse (*Equus caballus*), similar to other contemporary Mongolian settlements. Later, after Mongolian retreating, the livestock of the local economy was changed, being mainly represented by cattle (*Bos taurus*) and pig (*Sus domesticus*). The hunting records a very low rate during the Golden Horde period; this is probably a characteristic of Mongolian big cities.

This work was supported by a grant of Ministry of Research and Innovation from Romania, CNCS-UEFISCDI, project number PN-III-P4-ID-PCE-2016-0852, within PNCDI III.

349 IS ARCHAEOLOGY A CITIZEN-SCIENCE? THE ROLE OF ARCHAEOLOGISTS AND ARCHAEOLOGICAL INSTITUTIONS WITHIN OUR SOCIETY IN QUESTION

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Dunning, Ellinor (ArchaeoConcept; Université de Neuchâtel) - Salas Rossenbach, Kai - Marx, Amala (International affairs, Institut national de recherches archéologiques préventives - INRAP)

Format: Regular session

This session is about to highlight the different roles archaeologists and archaeological institutions are playing and will play in our societies. Our aim is to encourage reflexive postures on our practices and values. Indeed, if citizen-sciences and participation are becoming very popular, we also need to consider our roles as archaeologists and citizens and what do we want to achieve by producing archaeological knowledge.

We do consider that, as researchers and citizens, we have the responsibility to understand the way we produce “scientific content” and for whom and how do we share this knowledge.

This session offers the opportunity to discuss different topics such as:

- The way we produce knowledges and discourses upon the past and for whom; what is our social responsibility doing this? how archaeology can help finding solutions and answers in our present society about the current environmental – economical – ethical crisis our global world is facing?
- What is the role of mediation in archaeology: what do we want to transmit and how?
- What is our role as experts; what does “expertise” mean? How can we achieve inclusive co-creation of discourses and values about the past? How do we manage participation in content creation, research, transmission, preservation? That is, how far are we ready to go to implement inclusiveness in the production of knowledge? Is that necessary? What roles “the public” and the broader population are playing in archaeology and what for?

By asking these questions, our aim is to show diverse ways of connecting the scientific sphere (and the institutions that are supporting it) with different populations.

ABSTRACTS

1 PARTICIPATION AND THE ARCHAEOLOGY OF HADRIAN'S WALL: THE EVOLUTION OF THE ROLE OF EXPERTS AND NON-EXPERTS

Author(s): Alberti, Marta (Newcastle University)

Presentation Format: Oral

The history of archaeological exploration on Hadrian's Wall, the largest World Heritage Site and most researched Romano-British monument in the UK, is a complex tapestry woven by with threads of expert research and non- expert participation. Early excavations, such as those conducted under the patronage of John Clayton (1843-1890), made use of unqualified yet paid laborers. Francis Haverfield, considered the founder of Romano British archaeology as an academic subject, recruited unpaid labor supervisors and excavators amongst his own undergraduate students in the early 1900s. Today, the number of volunteers active at 11 Hadrian's Wall sites and museums outweighs the number of expert archaeological staff, with some volunteers offering financial contributions to operations in the form of donations or participation fees. In this paper, the relationship between expert and non-expert participants in archaeological research on Hadrian's Wall will be explored, with the aim to address the following questions: how has the role of both expert and non-expert participants in research on Hadrian's Wall evolved from the 19th century to today? Are today's non-expert participants comparable to 19th century unpaid labor? Are we, the Hadrian's Wall experts, involving non-expert participants in the creation of new knowledge, or are we simply respecting the centuries' old tradition of division between intellectual and manual labor? Can we (and should we) overcome the rhetoric of non-expert passive engagement and steer not only our actions, but also our discourse, in the direction of new forms of active non-expert participation?

2 CO-CREATING A DIGITAL TOOL FOR ARCHAEOLOGICAL FINDS: A CITIZEN SCIENCE EXAMPLE FROM FINLAND

Author(s): Wessman, Anna (University of Helsinki)

Presentation Format: Oral

Massive digitalization projects are currently going on in Europe and they have direct consequences for how we work within the cultural heritage sector. By opening up new digital collections of archaeological material we are making them accessible to everyone. This means that also non-professionals, citizen scientists, can start to use this data.

An undergoing citizen science project called SuALT (The Finnish Archaeological Finds Recording Linked Open Database) is currently developing a digital web service for the discoveries of archaeological material made by the public, which are mainly non-professional metal detectorists. Once the database is open it will give completely new access also to researchers and other find experts.

SuALT is collaborative project combining specialisms from different disciplines such as archaeology, semantic computing, cultural heritage studies and archaeological heritage management. Citizens are encouraged not only to help out with the development and design phase of the database, but they will also be the end users of the database, which means that they will produce the majority of its content.

By engaging the users in a democratic way, we are offering a possibility to make a true impact on the end product. We are currently doing user experience research amongst different stakeholders and end users. Through this research we will be able to ensure that the database is accessible, easy to use and offers a great experience to its users.

We are aiming for a genuine partnership between the different user groups instead of falling into a merely consultation-like approach. Our hypothesis, borne out by our UX research data so far, is that learning will be a major motivator for the metal detectorists to use SuALT. By fostering learning we can address some of the problems in this kind of citizen science systems, namely low quality of metadata.

3 SALONS ARCHÉOLOGIQUES – AN INITIATIVE TO QUESTION ARCHAEOLOGY FROM A CITIZEN'S PERSPECTIVE

Author(s): Dunning, Ellinor (ArchaeoConcept; University of Neuchâtel) - Aeschimann, Camille (ArchaeoConcept)

Presentation Format: Oral

What happens when archaeologists really meet the broader population? Practically, how to allow people to co-define the value of cultural heritage, and discuss the roles archaeology plays in their and our lives? How to expose our views and define our roles as archaeologists, in front of different unknown audiences?

The apparatus of the Salons archéologiques, a participatory project aiming to understand the representations of the Swiss population on heritage and archaeology, allows "them" and "us" to regularly meet and share our narratives upon the past and its role in our society. The Salons are organised on a regular basis in private flats, in a very intimate and relaxed way, outside of any institutional context. As such, they blur the lines between public and private spaces, and offer a mode of sociability based on direct exchange and trust.

Participants are invited to share their souvenirs, emotions, experiences, definitions, imaginaries and ask questions to the archaeologists. They also give their opinion upon the societal values they assign to heritage, and express their views upon the

practical functioning of the research. During these moments, archaeologists themselves are led to express their own view, and to confront it with the opinions of the participants, who do not necessarily have the same registers of values concerning the past. On which aspects do “them” and “us” agree and on which other differences arise?

With this project we create “intermediary zones” where different people could actually meet, share qualitative moments and live experiences, doing what could be called “citizen science”. This “liminality” between two normally separated spheres is going to be discussed in this paper, as well as the apparatus itself of the Salons archéologiques, seen as an effective way to question our roles and the way we want to create and share the knowledge we produce.

4 CO-CREATING ARCHAEOLOGIES : A DOCUMENTARY PERSPECTIVE TO COMMUNITY ENGAGEMENT AND REPRESENTATION

Author(s): Lupuwana, Vuyiswa (University of Cape Town)

Presentation Format: Oral

South African society came about from historical processes of segregation and disenfranchisement. A muting of indigenous voices. It is a complex and diverse social landscape and as a result there have been calls for the discipline to be more engaged in current socio-political issues made manifest through movements which have called for the transformation of the discipline and an African centered curriculum.

This paper explores the prospects of an engaged archaeology as a tool that raises the profile of the marginalized through the perspective of the wild foods co-create project that has spanned over three years. The project has worked on co-creating knowledge and livelihoods in consultation with local communities and a multidisciplinary array of researchers from the environmental and geographical sciences, ethics practitioners and law and policy advisers.

My role in the project has been that of an archaeologist and documentary filmmaker in exploring the intersection of archaeology and documentary as a means of representation and engagement. The documentary process has created an ethnographic archive on contemporary and historical food-way practices and represents the often-marginalized indigenous voices. The absence of histories and representations of dominated communities continues to aid structural inequality and marginalization. We argue here that archaeology can become a powerful tool to raise the profile of these voices and aid in the processes of representation and restitution.

Through an inter-sectional approach, we will engage with concepts of representation and visibility and visibility to further discuss approaches on engaging meaningfully with communities through archaeology and documentary film. How does the concept of visibility and visibility from a documentary perspective give communities agency within society and empower them to confront social justice issues?

5 ENGAGING WITH DIGITAL HERITAGE: INCLUDING YOU END USERS IN STRATEGY DISCUSSIONS ON HERITAGE PROTECTION

Author(s): Angeletaki, Alexandra (NTNU)

Presentation Format: Oral

The NTNU UB, Gunnerus library branch has been running workshops for several years for archaeology, archive students and heritage or Museum professionals in order to map the relationship they consider as important in their study activities when it comes to climate change or war as a factor for deterioration of heritage monuments. The workshops are based on design methods whose core philosophy is to include end-users as active participants in the design process and reflect on how we interact, work and learn in the context of a targeted activity, through observation, discussions, and teamwork so that a concrete idea is produced.

Previous research has suggested that visitors of a cultural heritage site or museum desire interaction and personalization in exhibits, but others have suggested that successful cases of ‘edutainment’ are far too seldom.

In 2019 we are running a course with engineering students on a masters level at the Norwegian University of Science and Technology (NTNU) who is challenged through a subject called “Experts in team” to find solutions on how technology can be used to disseminate History and Archaeology for younger generations and make it more interesting. Issues of authenticity have also been addressed by the students. The poster is the result of this work.

Including your end users in the process of choosing your strategy can be a way to go for museums and cultural heritage institutions as proposed here.

351 COMMUNITY ARCHAEOLOGY IN EUROPE

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Donnelly, Colm (Queen’s University Belfast) - Westmont, Camille (University of Maryland) - Benetti, Francesca (University of Padua) - McAlister, Grace (Queen’s University Belfast) - Baker, Christine (Fingal County Council, Ireland)

Format: Regular session

Community Archaeology is recognised as a major developing field within Public Archaeology at a global level. Archaeologists as well as governmental bodies are increasingly aware that engaging with local communities during archaeological projects is of

ethical importance to our profession, with this point being reflected through an increase in publications on community archaeology as well as in legislative documents such as the Faro Convention and Strategy²¹. This work has enabled members of the public to develop their knowledge of their local heritage through direct involvement in archaeological research and fieldwork, while at the same time becoming more familiar with archaeological practice. Community Archaeology, however, has also demonstrated that it has a strong social value – encouraging heritage management, resolving conflict and (perhaps most timely in today's society) holding the potential to assist in developing greater levels of self-esteem among participants, thereby making a valuable contribution towards overall community cohesion and well-being. The increased adoption of Community Archaeology as a form of public outreach in the last two decades has led to a diversity of approaches that reflect the variety of practitioners' goals and adaptation to unique circumstances. The session invites speakers from across Europe to present examples of Community Archaeology projects in action. Papers reflect on examples of positive – and negative – interactions and engagements between archaeologists and local communities, the strategies used to intertwine community involvement with archaeological research, the methodologies that have been used to measure the social value and impact of projects, and whether Community Archaeology has been successful in meeting communities' expectations while satisfying a wider research agenda. Ultimately, the session aims to provide a platform from which practitioners can discuss methods, share experiences, and improve communication within the field.

ABSTRACTS

1 HERITAGE, ARCHAEOLOGY AND COMMUNITY

Author(s): Mullan, Paul (Heritage Lottery Fund)

Presentation Format: Oral

The National Lottery Heritage Fund, formerly the Heritage Lottery Fund, is the largest funder of heritage in the UK investing more than £200m each year in heritage projects. Central to that mission has been connecting communities with their heritage. Over the 20 plus years of the fund's life archaeology has proven to be a powerful ally to community engagement in heritage through its ability to involve people and capture their imagination about the past.

This paper will explore how archaeology has been used by HLF projects across the UK, with particular reference to Northern Ireland. It will show the power of heritage to bring people together and challenge people's existing assumptions about the past. It will also show how communities' engagement in projects can be transformative to those communities sense of their own identity and, in particular, in creating new relationships between communities and their landscapes.

Paul Mullan is the National Lottery Heritage Fund's Country Director for Northern Ireland. He is currently undertaking PhD research of heritage in a divided society.

2 THE LOUGH NEAGH LANDSCAPE PARTNERSHIP – A COMMUNITY PERSPECTIVE

Author(s): Campbell, Liam (Lough Neagh Landscape Partnership)

Presentation Format: Oral

Community cohesion, participation and identity, a sense of place and ownership are the core benefits of participation in community archaeology projects. In the often contested landscapes of Northern Ireland, they are a perfect match for the rationale of Heritage Lottery funded landscape partnerships. They have a unique role in the HLF outcomes of increasing the understanding of the unique built and cultural heritage through new research, connecting (reconnecting) local people to the heritage of their place, developing heritage skills, understanding of the past ways of life and in turn interpreting the present. This paper from a community organiser's perspective, reflects on work at sites in Co's Tyrone, Armagh, Antrim over the past five years of inclusive "bottom-up" engagement and genuine participation and partnership between the Centre for Archaeological Fieldwork at Queen's University Belfast, the Lough Neagh Landscape Partnership, local councils and above all the local community. It is a powerful, hands-on method in helping to gain a better understanding of the past and at the same time can lead to a growth in well being and a sense of belonging.

3 PLACING COMMUNITIES AT THE HEART OF COMMUNITY ARCHAEOLOGY: THE EXPERIENCES OF THE CENTRE FOR ARCHAEOLOGICAL FIELDWORK

Author(s): Donnelly, Colm (School of Natural and Built Environment, QUB)

Presentation Format: Oral

The Centre for Archaeological Fieldwork (CAF) is a research and teaching unit based within the School of Natural and Built Environment at Queen's University Belfast. Established in 2002, the unit comprises a team of nine professional archaeologists and has completed over 450 archaeological projects. The CAF has also pioneered and facilitated community involvement in archaeological fieldwork projects across Northern Ireland over the past 16 years, work which has been developed and delivered through partnerships with a network of public, voluntary and community-based organisations and funders. By engaging with local communities in this manner the CAF has been able to facilitate members of the public - of all ages, backgrounds and abilities - to participate in archaeological fieldwork, with the professional archaeologists supporting members of a local community as they examine their past through direct involvement in the programme. The lecture provides an overview of the types of projects

that have been undertaken as we endeavour to place communities at the heart of community archaeology.

4 MORE THAN A NICE DAY OUT? EDUCATIONAL OUTREACH AND COMMUNITY ARCHAEOLOGY IN NORTHERN IRELAND

Author(s): Mcalister, Grace (Queen's University Belfast)

Presentation Format: Oral

The growth of community archaeology in Northern Ireland has increased the number of schoolchildren interacting with, and participating in, archaeology projects in the province. These community-based projects are a good way of promoting local heritage, increasing awareness of archaeological sites, and generating an understanding of archaeology as a profession. At the same time, there has been increased recognition of the benefits that 'outdoor learning' can have on social and academic development. With this in mind, local archaeological sites are a valuable learning resource and well-planned outreach activities which tap into different aspects of the curriculum have the potential to aid learning and support classroom teaching. This paper will look at trends noted during recent educational outreach in Northern Ireland and introduce methodologies being trialled to measure impact. Is participation by schoolchildren on archaeological excavations more than just a nice day out, and can it have a deeper impact which will benefit participants in the longer term? The Northern Ireland education system, which is largely segregated down religious lines, provides an additional backdrop for consideration within this discussion.

5 WHAT DO THEY THINK? PUBLIC ATTITUDES TO ARCHAEOLOGY IN IRELAND

Author(s): Doyle, Ian (Heritage Council of Ireland)

Presentation Format: Oral

In 2017 the pan-European NEARCH project published a public attitudes survey entitled Europeans & Archaeology. This study was conducted in 9 European countries (United Kingdom, France, Germany, Greece, Italy, the Netherlands, Poland, Spain, and Sweden).

In December 2018 the Heritage Council of Ireland carried out a comparable survey seeking to examine the perception of archaeological heritage in Ireland. This evaluates the understanding, interest, and attachment to archaeological heritage, and examines the public perception of archaeology, its strengths and its weaknesses. This is the first time such public attitudes have been surveyed in Ireland specifically on archaeology and the existence of the Nearch survey allows for a ten country/European context.

The underlying aim of conducting this survey is to identify new insights into archaeology and heritage so as to examine the relationship between communities and experts.

In a broad sense the answers show a very broad range of public support for archaeology, which sometimes exceed European averages, for example 92% see having archaeological remains as an advantage for a town and 83% see supporting archaeology as economically important for Ireland. Yet equally there are challenges to current models of practice with insights like documentaries being the most likely way to engage with archaeology (71%) with the traditional model of books mentioned far less (28%). Notably, 25% of the population would be interested in taking part in an archaeological excavation and this figure suggests that community archaeology projects involving excavation have a particularly important role to play.

This presentation will examine how we might best respond to such findings as we work to develop a community focused form of archaeological practice.

6 CREATING COMMUNITIES: A PUBLIC EXPERIENCE IN ARCHAEOLOGY

Author(s): Baker, Christine (Fingal County Council)

Presentation Format: Oral

Due to the specific Irish legislative framework, community archaeology in Ireland has developed as a hybrid of public outreach, and community-based projects, each having their own particular opportunities and challenges. Despite the lack of tradition of direct community engagement with archaeology and the limited opportunities, the public interest in directly engaging with archaeology has increased over the past number of years. Since 2015 Fingal County Council has developed community archaeology projects encompassing collaboration with artists, school-based events, geophysical survey, field walking and excavation, with the aim of increasing accessibility to the archaeological resource. The model developed in Fingal has not only created a new community of interested participants from all sectors of society but has created art works, and provided inspiration for participants to create their own projects (in teaching, tapestry, Irish language) and return to learning. The use of important archaeological sites that had gone out of memory or lacked community awareness has contributed to the place-making, creativity and community and reclaiming the sense of ownership. This presentation will examine the experience of community archaeology from the perspective of local government and the community participants.

7 BUILDING COMMUNITIES AND RECORDING IMPACT: THE DIG GREATER MANCHESTER EXPERIENCE

Author(s): Nevell, Michael (University of Salford)

Presentation Format: Oral

Dig Greater Manchester (DGM) was a large archaeological community engagement project operating within Britain during the years 2011 to 2016. Its scope and scale was designed to assess the real impact of enabling local communities and individuals

to acquire and enhance heritage skills and awareness of heritage-based practices, whilst also contributing the exploration of the city region's experience of industrialisation. At its heart was a core of skills-training that was intended to lead to a legacy of community involvement once the project was finished. Thus, the project trained through 110 skills-based workshops over 1400 volunteers and engaged on-site with 41 special interest groups, and on-site and in the classroom with more than 3400 school children, and led to several spin off community projects. This paper looks at the ways in which the Dig Greater Manchester community archaeology project set about recording the impact of the project on individuals and communities. These approaches included a three-strand research design aimed at covering the significance of community archaeology, the practice of community archaeology and the archaeology of industrialisation. The community impact data was captured through specifically-designed feedback questionnaires (sample size 210), one-to-one interviews (sample size 24), and the input of psychology researchers from the University of Salford. The results provide reliable data on how archaeology engagement activities can help to build communities and break down barriers, but also shows areas where engagement approaches are weak amongst certain age groups, ethnic and social backgrounds.

8 PARCO DI ARCHEOLOGIA CONDIVISA. CITIZEN SCIENCE, ECONOMY AND WELL-BEING FOR THE ARCHAEOLOGICAL EXCAVATION OF THE THIRD MILLENNIUM

Author(s): Megale, Carolina (Past in Progress)

Presentation Format: Oral

Since 2008, the global archaeology project that takes place at the archaeological area of Poggio del Molino (Populonia, Tuscany) sets the relationship between researchers and citizens at the centre of its experience. The field research is managed through a field school for students and volunteers from all around the world: the archaeological excavation is where archaeology is shared and where professionals work on behalf of the community, while citizens contribute to the research with excavation assistance activities, well aware that the past belongs to all of us.

Following the principles of crowd-economy, the scientific research is funded by those who take part in the excavations, by means of micro-patronage and of sponsorships from private companies. The archaeological field school at Poggio del Molino is open to everyone. On site, tasks are allocated depending on the different ages and the personal goals of the participants.

The aim of the project is to organise and create a shared archaeological area: a public area accessible to everyone where citizens can spend their free time and be involved in the excavations process. In the hopes of professionals the creation of this Park will lead to an increase of the reception capacity of the site by organising spaces shared by archaeologists and the community, by further improving the educational and communicational programs. In addition to this, the project will aim to restore a portion of a unique territory that can be given back to the people, so they may take benefit from their own cultural heritage.

In the modern world of knowledge, the ongoing experience at Poggio del Molino demonstrates how the will to extend and embed the role of archaeology in contemporary society can produce benefits, not only on a theoretical level of historical research but also on practical, economic and social levels.

9 THE TEXEL STOCKING PROJECT. LESSONS LEARNED FROM A RECONSTRUCTION PROJECT INVOLVING COMMUNITY ARCHAEOLOGY

Author(s): Brandenburgh, Chrystal (Erfgoed Leiden en Omstreken; Brandenburgh Textile Archaeology)

Presentation Format: Oral

In 2014 a 17th century shipwreck was found off the coast of the island Texel, The Netherlands. Divers salvaged numerous finds from the wreck, including a silk dress and a pair of silk stockings. Information about the finds from the wreck quickly went around the world and the objects were discussed in detail in the international press.

The silk stockings from the wreck became the centre point of an exciting reconstruction project conducted by the Textile Research Centre in the Netherlands. The aim of the project was to gain knowledge about the production and use of these garments. To help answer these questions a series of reconstructions was made involving as many as a hundred experienced knitters from all over the world. These knitters shared their knowledge and craftsmanship with the textile archaeologists who investigated the stockings.

This paper will focus on how this group of knitters became an essential part of the archaeological research. It shows in what way both archaeologists as well as craftspeople benefitted from being part of the project and what they learned from each other. Lastly it aims to offer insight in the lessons learned and best practices for future citizen- or community-science projects in other areas of archaeology.

10 COMMUNITY ARCHAEOLOGY IN RURAL ENVIRONMENTS: NEW APPROACHES TO UNDERSTANDING THE IMPACT OF PARTICIPATIVE ARCHAEOLOGY FOR RURAL COMMUNITIES IN EUROPE

Author(s): Lewis, Carena (University of Lincoln) - van Londen, Heleen (University of Amsterdam) - Marcinak, Arkadiusz (University of Poznan) - Vareka, Pavel (University of West Bohemia)

Presentation Format: Oral

The paper will present and contextualise the aims of a new 3-year joint project, CARE-MSoC (Community Archaeology in Rural Environments Meeting Societal Challenges), funded through the European Commission by national research councils in the Czech

Republic, Netherlands, Poland and UK to build capacity in the heritage sector across Europe to help rural communities through participative community archaeology projects (<http://archaeologyeurope.blogs.lincoln.ac.uk/>). CARE-MSoC will use an approach which has the advantage for research purposes of being replicable in any rural community: involving residents in small 'test pit' excavations within their own villages in order to throw new light on their settlement's long-term development. This approach has been shown to achieve a wide range of wider social benefits in the UK (including democratising knowledge, instilling new transferable skills, raising academic aspirations, increasing social mobility, enhancing self-esteem, extending social networks, enriching lives, connecting people with place and strengthening social cohesion) while also helping protect archaeological remains. Combining methodologies from archaeology, historical geography, social psychology, digital humanities and medieval studies, CARE-MSoC aims to explore the precise mechanisms by which these community archaeology project achieve this wider impact, and use these insights to develop methods for adapting existing approaches to suit different pre-existing circumstances in different countries.

11 WORKING WITH COMMUNITIES: PUBLIC PARTICIPATION FROM THE ARCHAEOLOGISTS' PERSPECTIVE

Author(s): Moeller, Katharina (Prifysgol Bangor University) - Benetti, Francesca (University of Padua) - Ripanti, Francesco (University of Pisa)

Presentation Format: Oral

Opinions and practices in regards to public participation in archaeology vary widely in different countries. While so-called 'community digs' and other forms of participation are very common in the UK and volunteering opportunities can be easily found on the internet, the situation in Germany and Italy is different. Unlike in the UK, all excavations in the two continental European countries require a permit from the respective state heritage agency, due to more restrictive heritage laws and policies. In Germany, volunteering with the state heritage agencies is possible, but actual community archaeology projects as those common in the UK are rare. In Italy, public participation in excavations is at present prohibited by the state heritage agency's current policy, which restricts volunteers to 'support activities' (such as logistics), despite Italy being in the process of ratifying the Faro Convention. Therefore, archaeologists are forced to find other ways to enable the public to participate in archaeological research.

To identify the challenges that archaeologists have to face when working with the public across Europe and to better understand professional archaeologists' attitudes towards public participation and see whether the different laws and policies have shaped them, a survey was conducted amongst British, German and Italian archaeologists. The results will be presented in this paper.

12 COMMUNITY ARCHAEOLOGY IN EUROPEAN ETHNIC ENCLAVES IN THE UNITED STATES

Author(s): Westmont, Camille (University of Maryland)

Presentation Format: Oral

Community archaeology projects often evoke personal connections between participants and the heritage they excavate. In the former coal mining region of Pennsylvania (USA), a community archaeology project focused on life in 19th century Eastern and Southern European ethnic enclaves is changing the ways that local descendant communities conceptualize their ethnic identities today. The project, a joint effort between the University of Maryland and Eckley Miners' Village, an open air museum that interprets 19th century coal company town life, has a wide following within the local, white, aging population. Although the local population has always felt a strong affinity to Europe and have consistently defined themselves in accordance with their ancestors' European origins, the community archaeology project has unintentionally provided institutional legitimization for their modern identities as European-Americans. Through inviting community participation in the excavation of the material culture of 19th century immigrants, we have paved the way for community members to develop deeper connections with Europe rather than with their own communities. While community archaeology often results in strengthening participants' sense of connection to place and building place-identities, in this instance, the archaeological remains of the transnational identities of the 19th century workers have strengthened participants' sense of belonging to countries they have never visited. In this paper, I explore the role of public archaeology in (inadvertently) perpetuating and strengthening imagined communities and the ways that communities can be adept at adapting the results of community archaeology excavations to serve their own purposes.

13 THE ARCHAEOLOGIST WITHIN: AN EXAMPLE OF COMMUNITY ARCHAEOLOGY WITHIN A CONTENTIOUS SETTING

Author(s): Ilves, Kristin (University of Helsinki)

Presentation Format: Oral

The Åland Islands is an autonomous archipelago in the Baltic Sea. With its 29,000 inhabitants and own legislation concerning the protection of archaeological sites, archaeology has been a very infected subject matter for decades. This can be said to have culminated in 2013 in a controversial trial and conviction of a family severely and knowingly damaging one of the oldest Stone Age sites on the islands. On this backdrop, a research excavation project was initiated concerning a Late Iron Age settlement site. The project had a clear focus on public communication and community archaeology was of prime importance, which is unusual in the region, where archaeology is highly professionalized. The situation required a custom made strategy implemented over several years. A very active relationship had to be established and maintained with local people. Lots of energy was invested in continuously disseminating the plans, methods, results and interpretations of the project and archaeology in general. An awareness of the inherently political nature of archaeological communication permeated the setting. Experiences from the project have

highlighted the value of inclusion, transparency and engagement as factors leading to changing attitudes towards archaeology. Simultaneously, an interesting dichotomy has been revealed between the attitudes of the public and the heritage management sector, thereby showing that the social dynamics of archaeology itself constitutes a peril when it comes to community oriented projects such as this.

14 **HARD ROADS TO TRAVEL: LESSONS LEARNT FROM PRACTICING COMMUNITY ARCHAEOLOGY**

Author(s): Sayer, Faye (Manchester Metropolitan University)

Presentation Format: Oral

Over the last few years, Manchester Centre for Public History and Heritage (MCPHH) have developed regional, national and international community archaeology projects with marginalised and disadvantaged communities, and within areas in which archaeology is often disregarded, socially, economically and politically. As such, these projects have employed innovative approaches to the co-production of historical and archaeological knowledge, and all have had ethical implications for academics and participants, for projects that actively engage the public in archaeology often do so by linking modern day communities to historical communities, and in the process uncomfortable truths and painful pasts can be uncovered. In order to explore the issues raised by such work, this paper examines some of the experiences from recent community archaeology projects, including case studies drawn from work in the UK and Nigeria. In doing so, the paper will discuss lessons learnt from these 'socially engaged' community archaeology projects, including such issues as dealing with conflicting values, ensuring long-term sustainability, supporting duty of care, and understanding psychological and emotional risk.

352 **FINANCING THE FUTURE DEVELOPMENT OF MEMBERSHIP SERVICES AND SUPPORT WITHIN THE EAA**

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Pavlickova, Krisztina - Gowen Larsen, Margaret (European Association of Archaeologists)

Format: Round table

The EAA has been experiencing steady growth since its foundation twenty-five years ago. The growth has accelerated in the recent years in correlation with EAA's firmer grasp of its executive and administrative functions. EAA's strategic vision is to provide a far wider range of services to its members. In addition it seeks to secure financial assistance for a greater number of members who wish to participate in EAA Annual Meetings. To achieve this ambition, EAA must increase and diversify its sources of revenue and seek new ways to raise finance and funding for the support of members. This round table, initiated by the EAA Executive Board, seeks to consult with members and others experienced in the field of fundraising and the financing of 'not for profit' organisations in Europe. Experience in raising funding in Europe for archaeological networks would also be beneficial. We aim to have participants that are willing to share their expertise and experience for the benefit of EAA members and the EAA as a whole. Ideas brought forward will be further analysed by the EAA Executive Board who will consider their suitability for the EAA's strategic planning.

353 **LET'S TALK ABOUT SEX**

Theme: Archaeological theory and methods beyond paradigms

Organisers: Rindlisbacher, Laura (Integrative Prehistory and Archeological Science, University of Basel) - Nicklisch, Nicole (Danube Private University)

Format: Regular session

The socio-theoretical as well as the bio-medical research of recent years has revealed the complexity of the categories «sex» and «gender». Biological sex is not only shaped on different levels (chromosomal, gonadal, hormonal, epigenetical) but the manifestation of sex characteristics can – because of their polygenic regulation and the variety of influencing factors – be highly variable. The binary model of the sexes, which is prevalent in many countries of the Western world, represents only one possible way in which a society may translate the different manifestations of sex characteristics into the cultural sphere of gender. The category «gender», in the sense of a description of observations about the handling of the dead, mortuary rites as well as any accompanying artefacts in relation to bio(archaeo-)logical sex indicators – is a central topic of modern archaeological interpretation. The focus of this session lies on the interdisciplinary examination of the implications of these new findings for established concepts of «sex» and «gender» especially when reflecting those concepts against the backdrop of the social structures of past societies.

ABSTRACTS

- 1** **SIZE MATTERS! - METRIC AND MORPHOLOGICAL SEX MARKERS AND THEIR VALUE IN ARCHAEOANTHROPOLOGICAL ANALYSES OF HUMAN SKELETAL REMAINS**

Author(s): Navitainuck, Denise - Vach, Werner (University Hospital Basel) - Alt, Kurt (University of Basel; Danube Private University)

Presentation Format: Oral

Biological sex, alongside age at death, is among the most essential information about an individual from an archaeological context, and a key building block for population studies. An accurate assessment of these parameters is highly dependent on the preservation and integrity of human remains.

This study analyses different metric and morphological traits previously utilised for sex determination of human skeletons. Based on an early medieval skeletal series (Mannheim-Bösfeld, Germany), the authors' aim is to develop a recommendation for a minimal set of traits which allows sufficiently accurate sex determination for a maximum of individuals. In this session, study design will be presented.

First, the sex-specific population means and standard deviations have been compared with those from the original publications in order to evaluate the likelihood that standards developed based on other populations are transferable to the population of the Bösfeld site. An additional, indirect approach is also applied: a test's accuracy is compared with measured accuracy when a new test is constructed on the basis of the trait (or score) in the Bösfeld data, and the proportion of the population for whom determined sex changes is calculated.

Secondarily, test accuracy is gauged on the basis of determined sex. Sex determination is based on three independent reference standards: Diagnose Sexuelle Probabiliste (DSP; Murail et al. 2005), using the subjects with a posterior probability for male or female above 0.95 based on metric pelvis traits; latent class analysis (LCA) of all traits to obtain a posterior probability for each individual; and an archaeological assessment based on gender-specific grave goods.

Finally, the utility of traits and trait groups, defined as the probability of obtaining a posterior probability above 0.95 for a randomly selected individual, is evaluated.
- 2** **OSTEOLOGY DEFINES SEX AND ARCHAEOLOGY DEFINES GENDER? INSIGHTS FROM PHYSICAL ANTHROPOLOGY**

Author(s): Kranzbühler, Johanna (Firma Skelettanalysen)

Presentation Format: Oral

The ability to determine the sex of a skeletal specimen is an indispensable resource to the field of physical anthropology, as it provides vital information regarding the demographic composition, death rate, life expectancy, and the burial customs correspondent to each sex. These customs include occupation-based layout patterns in mortuary sites and, crucially, sex-differentiated grave goods. However, in analysing these data, archaeologists often draw conclusions related to the societal roles of the deceased, creating an area of overlap in which the bioarchaeological, anatomical assignment of sex and the archaeological, social concept of gender both come into play. Due to this dichotomy, the assumption is that the field of physical anthropology will be able to provide, definitively, the biological sex of the deceased individual, in order that societal roles may be inferred by archaeologists. This paper discusses the possibilities and limitations of osteological sex determination and asks if physical anthropology really provides the bare facts of a person's biology, moreover it presents an idea how methodological limitations can be faced.
- 3** **RECLAIMING THE SPECTRUM – A DIFFERENTIATED APPROACH TO OBSERVE THE NUANCES OF OSTEOLOGIC SEX**

Author(s): Rindlisbacher, Laura - Pichler, Sandra (Integrative Prehistory and Archeological Science, University of Basel)

Presentation Format: Oral

There is increasing evidence that the concept of two distinct sexes is too simplistic to describe the corporeal reality of the human experience (Ainsworth, 2015). This poses both methodological and theoretical challenges which call for a critical examination of the archaeological and bioarchaeological tool kits.

Osteoanthropologists use various methods in sexing human skeletal remains. Multivariate discriminant procedures can produce results within a forensic confidence range. The morphognostic assessment of sex variants, on the other hand, may vary considerably in its reliability. Studies often aim to attribute individuals "securely" to one of two sex categories "male" or "female", that is to identify sex unequivocally. This also answers to a particular desire voiced by archaeologists. Assignment of a "probable" or "the wrong" sex is more often than not ascribed to the uncertainties of the osteologic methodology and the individuals excluded from further analysis.

In order to evaluate the whole spectrum of sex characteristics in human skeletal remains a new approach to assess osteological variability is required. By combining the morphologic assessment of characteristics and metric data, one may not only assign osteologic sex but also assess the corporeality of individuals. The aim is to visualise the nuances of sex differences in a given sample and to enable new insights into differentiated categories of gender. First results of this complex approach are presented

using the example of an early modern skeletal series from Basel, Switzerland.

References

Ainsworth, C., 2015. Sex redefined. *Nature News* 518 (7539), 288.

4 FORGET ABOUT SEX – LET US TALK ABOUT GENDER

Author(s): Pichler, Sandra L. (IPAS, University of Basel)

Presentation Format: Oral

Its self-perceived positioning in the sciences, chiefly in biology, has long restricted European and especially German speaking osteoanthropology. With few exceptions, the discipline has generally remained static in its scientific focus and interpretations, commonly applying a simple binary model of the sexes. Discrepancies between skeletal and archeological sex are usually attributed to the cultural sciences' perception of gendered objects. Individuals of the in-between categories are regarded as insufficiently distinct rather than constituting the reflections of a nature-nurture continuum. This also applies to recent approaches like biogeoarcheometric dietary or mobility reconstruction by stable isotope analysis, and even more so to ancient DNA studies. Addressing the challenges presented by social bioarchaeology in discussions across disciplinary borders creates opportunities for advancing our concepts of social roles and rules shaping lives and bodies in former communities.

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5 WOMEN-WARRIORS OF THE EARLY NOMADS: SOCIAL STATUS SPECIFICITY ACCORDING TO THE NECROPOLISES PLANIGRAPHY ANALYSIS

Author(s): Yatsenko, Sergey (Russian State University for the Humanities)

Presentation Format: Oral

The most important Scythian necropolises with several women-warriors in the Lower Dnepr Basin (Mamai-Gora, Skel'ki, Ryadovye Mogily), the similar necropolis of the Middle and Late Sarmatian Cultures (Novyi, Vysochino) in the Lower Don Basin and also the sedentary necropolises of Greeks (Tanais) and Maeoties (Kobyakovo) - which include the Sarmatian wives with weapons - are analyzed.

The corpses of most of nomadic women of the late 5th c. BCE – the 3rd c. CE who died in the war remained on the battlefield and did not get to the clan cemetery. At the same time, the women-warriors often occupied a special place of honor in the structure of the necropolis. The women-warriors in the graves are usually the age of 25-30 years, after long years of marriage. In the more early age (in period the main military activity, from the age of 12) the weapons are usually absent with them. The placement of the weapons was, probably, due to two factors: it was associated with special personal military merits in previous years and with the status of the family (or husband) at the time of the woman's death. The set of female weapons in each community was different from the male. The weapons more prestigious than the usual arrows sometimes dependent on age group or from the specific traditions of the woman's clan (which used a specific type of graves). The relatives were not keen to place in the grave of the woman a full range of her weaponry (probably, they sometimes put with the woman their weapon similar to that which she used). For the socially significant woman to denote her status was sufficient to have the weapons of more rare type (one to four spears and scaly armor for Scythians; the axe, long sword or three different blades for Sarmatians).

6 NON-BINARY LIFE CONDITIONS STUDIES: APPLYING "GENDER" AS METHODOLOGY

Author(s): Goulart, Luana (Université Côte d'Azur; CNRS; CEPAM)

Presentation Format: Oral

When studying life conditions of past populations one must consider the interaction of both biological and cultural factors, since nutritional status and biological well-being are also influenced by environmental factors and social inequalities, which can lead to differential access to nourishments and to medical care.

In bioarchaeological works, researchers use stature and body shape (or directly bone measurements) to evaluate populations' life conditions, usually dividing the sample according to biological sex, since stature is considered dimorphic in our species. However, considering biological sex as an "a priori" category can force a binary division of the sample and hide a more diverse variability. Not all females and all males are subject to the same life conditions, since many elements interact and shape the gender experience someone lives (intersectionality). Hence, we propose the observation of the biological sex as an "a posteriori" category.

In this paper we applied a clustering method (factor analysis of mixed data) to anthropometric values from individuals (n=96) exhumed from the archaeological site Capuccin de Ferrières (south of France – 1720-1721). We conducted three experiments, firstly using as variables just anthropometrical data (femur length and transverse femoral shaft diameter); secondly, we added the biological sex divided in four classes (female, probable female, male and probable male); and thirdly we considered a binary sex (female, male) variable. The three tests yielded different group compositions: in the first one, even though there was a sex predominance, all groups were mixed; in the second test, only three individuals were classified with the opposite sex; and the third analysis presented female-only or male-only groups, forcing a binary division that is not present in the anthropometric data.

Theme: Archaeological theory and methods beyond paradigms

Organisers: Hanscam, Emily (Durham University) - Mandich, Matthew (The International Society for the Archaeology, Art and Architecture of Rome - ISAR)

Format: Regular session

There has been a long ongoing conversation about the relationship between the Roman past and contemporary politics in Europe, centered around the debate over Romanisation which began during the mid-90s in the UK. While global politics have changed greatly over the past few decades, and theoretical approaches in Roman archaeology have likewise diversified alongside the postcolonial critique, discussions about the politics of Roman archaeology frequently still revert back to the Romanisation debate.

We recognize that the political situation for all archaeology, not just Roman, has grown increasingly complex and nuanced across Europe over the past few years with the rise of nationalism and populism. Furthermore, it would be a mistake to assume that we can make blanket statements about the politics of the Roman past in Europe given the many unique local social contexts. While Romanisation does persist in certain cases, different research traditions and political histories across Europe also bring a diversity to how archaeological research relates to contemporary politics.

This session therefore aims to discuss the contemporary political impact of Roman studies across Europe in the 21st century, incorporating as many different regions as possible in this conversation. The aim will be to create a dialogue which both challenges ongoing presumptions about Romanisation and highlights the need for an ongoing critique of the politics of the Roman past. We welcome contributions addressing the politics of Roman archaeology on local, regional, or national scales across Europe.

ABSTRACTS

1 WRITING AND READING ROME IN THE REPUBLIC OF IRELAND

Author(s): Ó Riagáin, Russell (Heidelberg Centre for Transcultural Studies)

Presentation Format: Oral

In contrast to several other nearby regions of Europe, a strong element of Irish national sentiment has been constructed around the island of Ireland having lain outside the Roman Empire. The treatment received by the Roman world in a series of twentieth-century textbooks intended for secondary school history teaching will be outlined and critiqued, as will the ways in which it has fed into both popular and academic discourse. It will be discussed how this treatment developed out of a colonial opposition in which the British Empire was seen as a core territory, progressive and equated with the Roman past and Ireland peripheral and equated with a timeless barbarian Europe. This opposition was internalised and embraced by Romantic nationalists and pan-Celticists on both islands and has strongly informed post-colonial discourse in Ireland, not least in the education system. Recent work on Ireland in the late Iron Age and early medieval period has begun to break down this opposition; this paper will close with a transcultural critique of the main elements of the Roman-Irish opposition, recognising instead, as several recent scholars have, that the Roman Empire had a strong, if not quite defining, influence on ideological and material cultural practices and the political changes ongoing in Ireland c.300–600 CE—transculturation, if not Romanisation.

2 VALUING IRON AGE AND ROMAN HERITAGES IN BRITAIN: THE POLITICS OF HERITAGE

Author(s): Hingley, Richard (Dept. of Archaeology, University of Durham)

Presentation Format: Oral

This paper addresses some of the contrasting values attributed to Iron Age and Roman ancient monuments and open-air museums in Britain. The Iron Age and Roman periods often seem to be made to operate in opposition to each other in terms that have been defined as 'insistent dualities', including civilisation - barbarism (Hingley et al. 2018). Iron Age open-air museums with reconstructed roundhouses are particularly common and these tend to emphasise egalitarian living and outdoor pursuits. They provide a contrast with the hillforts that are scattered across Britain, which have tended to be interpreted in the context of warrior elites.

Roman venues are rather more common and include high-profile ancient monuments, forts, fortresses, towns and villas. These are used to communicate ideas of military identity, social hierarchy, gracious living, progress, order and civilisation. Such concepts, evidently, fit the Romanisation agenda that was heavily critiqued by archaeologists and ancient historians during the 1990s.

These Iron Age and Roman values are tied in with the school education agenda in England which emphasises the progress of Roman civilisation, downplaying the significance of the Iron Age. The Iron Age open air museums have been developed, in part, to counter this Romanocentric conception. Exploring the values inherent in conceptions of the Iron Age and Roman past emphasises the potential to tell additional tales about violence, assimilation, population mobility and forced incorporation.

How are these messages to be addressed in school education, where the main emphasis is upon positive images and messages from the past? Is portraying the past as preferable to the present an entirely helpful approach in the current climate?

3 THE TENDENCIES OF ROMAN ARCHAEOLOGY IN EUROPE: THEORETICAL VS. TECHNICAL APPROACHES

Author(s): Lopez Garcia, Antonio (University of Helsinki)

Presentation Format: Oral

In recent decades, the archaeological discourse applied to Roman studies has suffered an unequal evolution among European countries. While in Southern Europe, the studies have been focused more intensely on technical aspects, in the countries belonging to Central and Northern Europe the approach followed is merely theoretical.

Nowadays, it is quite common to find collaborations among research teams from different parts of Europe. This trend has allowed to establish a compromise between technical studies, such as urbanism, epigraphy, architecture or material culture, and theoretical studies focusing towards an in-depth study of conceptual, ethical, social and political issues such as Romanization, republicanism, or gender studies.

These international collaborations have devoted their efforts to study all the possible technical and theoretical aspects related to the issues analyzed. However, there are serious problems concerning both archaeological trends. It is not uncommon that language differences lead us to ignore or neglect these technical or theoretical studies focused on concrete issues. For example, it is sometimes quite difficult to find mentions of works written in Romance languages on British, German or Nordic publications. However, for what concerns the Italian, Spanish or French publications, it is usual to find on them mentions to books written in English and German, but these tend to be studied regarding their technical aspects.

The goal of Roman archaeology in the 21st century must be to integrate both tendencies into one. Perhaps, the SpaceLaw project funded by the ERC in Helsinki could be an example that sets the path for a new approach to deal with the issues related to the politics of the Roman past considering both points of view: Technical and Theoretical. The main aim of this paper is to discuss the reasons underlying the different criteria and themes undertaken by researchers from Europe when studying the Roman past.

4 THE PROBLEMS WITH THE THIRD ROME: ROMAN PAST IN TURKEY

Author(s): Dikkaya, Fahri (TED University)

Presentation Format: Oral

After the fall of Constantinople, Mehmed II adopted the title *Kayser-i Rûm*, claiming succession to the Roman Imperium. This title was then used by many Ottoman sultans for centuries, employing it as an insult against their European rivals. In the 19th century, the Ottoman sultans ceased using this title – and identifying with the Roman past – as the first Ottoman archaeologists began to study the Roman heritage of the Ottomans. During the Republican Period of Turkey, the Roman past and its archaeology played a crucial role for Turkish political manoeuvres against Italy, a nation-state identifying as “the Third Rome”, or the presumed successor of the legacy of ancient Rome. In this newly developed and politically charged political climates, Hittites were considered to be the founding fathers of Anatolian Turkey, a concept that was developed *vis-a-vis* Italy’s New Rome. Within this context, the Roman past of Turkey was reformulated with deep roots in Anatolia after the 1960s, with Ekrem Akurgal’s theoretical approaches that clearly had a nationalistic agenda. In the 21st century, Turkish archaeologists, Ottoman historians and other intellectuals began to criticize the politicalization of Anatolian Roman past. Research on Roman Anatolia was popular, paving the way for new approaches in archaeology, and contributing to the politics on how Anatolia’s Roman past was displayed in Turkish museums and perceived in history and archaeology. After a short survey of the role the Roman past held in the late Ottoman and early Republican periods, this paper will discuss recent political dynamics, focusing in particular on the criticism of the Roman past in 21st century Turkey.

5 ‘STAND YOUR GROUND!’: NOTHING NEW IN SERBIA

Author(s): Cvjeticanin, Tatjana (National Museum in Belgrade)

Presentation Format: Oral

Although the identification of archaeological heritage (and the interpretation of the past) is not the exclusive right of archaeologists, our authorized discourse is predominant in the public sphere. Especially after the 2000s, Serbian archaeology has helped to firmly root in the public discourse the linear connection between the Roman state and present-day Serbia. The increasing number of emperors born on the present-day Serbian territory (as counted by archaeologists) becomes evidence for Serbian importance. While there are rare voices stressing local circumstances—some scholars have been questioning traditional models—Romanisation is still the prevailing concept, especially among research institutions and practitioners, i.e. in museums. Culture-historical images and illustrations of the grandeur and superiority of the Roman Empire, and the progress under the Romans, are presented to the public through many archaeological sites and exhibitions. A whole spectrum of social experiences (e.g. oppression, slavery, famine) is ignored or trivialised. The aestheticised past, one-dimensional interpretations, outdated disciplinary concepts and sensationalism are entrenched (especially) in the Roman frontier studies. The complex process of the nomination of the Serbian limes for the UNESCO World Heritage list, as part of the Frontiers of the Roman Empire WHS, is a process that should balance between research, conservation, interpretation and presentation. It is conducted, however, primarily from a single institution, geared mainly towards research, without coordination with other professionals, including museum and heritage specialists, and critique is not welcome. As a result, the Roman frontier is considered primarily as a demarcation zone and in the

terms of how many forts will be included, without wider debate on the paradigm changes and current theoretical concepts.

6 WHAT'S IN A NAME?: THEORETICAL APPROACHES TO ROMAN ARCHAEOLOGY IN ROMANIA

Author(s): Hanscam, Emily (Durham University)

Presentation Format: Oral

Romania is a country named for its Roman past. When the modern nation-state was founded in the mid-19th century, its inhabitants were believed to be the living descendants of the Romans who 'civilised' Dacia in the 2nd century CE. Approaches to the study of the past in Romania evolved alongside the national narrative—during the early 20th century the indigenous Dacian element began to assert itself concurrent to the advent of cultural-historical archaeology, and presently the Daco-Roman continuity thesis remains with micro-supports for Romanian nationalism embedded into research. There is a growing movement in Romanian archaeology for an increasing critique and awareness of the impact of politics, but the establishment remains entrenched. This paper explores the history of Roman archaeology in Romania from the 19th century to the 21st century, examining how the discourse of the Roman past both creates and sustains the nation. It argues that the adopted of new theoretical approaches in Romanian archaeology are frequently related to wider political developments.

7 CURATING COHERENCE, DISPLAYING DIFFERENCE: SCALES OF ROMANITAS IN EUROPE

Author(s): Witcher, Robert (Durham University)

Presentation Format: Oral

The Roman past occupies a significant position in European cultural heritage. The legacy of this empire has been drawn upon by successor states for centuries to legitimise contemporary configurations of power and culture. This establishes the Roman past as both universal and particular: a shared experience of empire overlain by diverging historical, political and cultural trajectories. This tension has been brought to a head by globalisation, which has simultaneously de-territorialised nation states and sown the seeds for their revival. Roman cultural heritage provides a lens through which to evaluate this shifting political and cultural identity-making.

I outline a hypothesis about European museum displays and their relationship with contemporary identities. The collections displayed in national (primary) museums operate on the global scale, creating a narrative of shared Roman culture epitomised by objects of the highest quality (marble sculpture, mosaics, public inscriptions), often originally found outside of the national territory in which they are displayed, plus the best finds from across their home nations. Meanwhile, local (tertiary) museums concentrate on objects found in their immediate territories, with emphasis on utilitarian and quotidian artefacts such as pottery and small finds. These museums foster local engagement with the past through tangible material traces of the Roman period that gain resonance from their local provenance. It is, however, at the regional (secondary) museums that global and local vision of the Roman past intersect. Free of the global pressures incumbent on national museums, regional museums promote narratives of hybridity—presenting distinctive geographical manifestations of Roman culture, whether glass-making in Roman Germany or military culture on the Hadrian's Wall. It is at this meso-scale that the diversity of the Roman Empire is most visibly constructed. This paper explores the implications and the possibilities of this hypothesis in the context of the rapidly shifting political landscapes of Europe.

356 THE POWER OF THE INVISIBLE. DISCUSSING SOCIAL, POLITICAL AND ENVIRONMENTAL IMPACT OF TRANSFORMATIONS IN TEXTILE PRODUCTION

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Sabatini, Serena (University of Gothenburg) - Fulminante, Francesca (Bristol University)

Format: Regular session

The study of textile production during the Bronze Age and Iron Age has suffered from a lack of scholarly attention. There are several reasons for this, including the dearth of physical evidence in the form of substantial examples of ancient textiles, as well as the prevalence of traditional assumptions that regard the tools, such as those used for spinning and weaving, as lacking historical significance. The situation has now changed, and a growing number of studies have demonstrated that Bronze Age and Iron Age textile manufacture in Europe and the Mediterranean has, to a great extent, been a part of large-scale and well-organized production systems, whose outcomes were traded and consumed over vast areas, nourishing long-distance networks and resulting in the flourishing of distinct local economies. It is argued that textile production not only played a relevant economic role, but also that economic and technological transformations related to such productions represented factors that likely contributed to the development of contemporary transformations, and eventually crises.

The participants in this session will be asked to discuss the evidence for economic and technological transformations related to textile production, and to consider the cultural, political and environmental impact it had. Archaeologically, we can study differences over time, assessing the quantity and characteristics of:

- textile tools
- sheep bone assemblages suggesting wool production
- pollen diagrams showing the cultivation/presence of specific fibres

In this session we will discuss such changes in the light of the political, social and environmental transformations that may be

inferred.

This session is supported by following projects: THESP (<https://historiskastudier.gu.se/english/research/bronze-age-wool-economy>) and PROCON (<https://www.arch.cam.ac.uk/research/projects/procon>).

ABSTRACTS

1 WARP AND WEFT: DEEP-TIME HUMAN-SHEEP ENTANGLEMENTS OF KNOWLEDGE SYSTEMS OF LANDSCAPE MANAGEMENT, TEXTILE PRODUCTION AND GENDERED IDENTITIES

Author(s): Armstrong Oma, Kristin - Kristoffersen, Elna Siv (University of Stavanger, Museum of Archaeology)

Presentation Format: Oral

Wool textile production is impossible without sheep. However, the life of sheep and their prerequisite to thrive are invisible in textile studies. Sheep are sentient beings with the capacity to act as co-domestic beings and as such, co-creators of shared human-animal lifeworlds. Today and in the past, sheep are important animals in terms of social life, resource management and transhumance. This paper considers how humans and sheep share a deep history of co-domestic traditional ways of living in Western Norway that goes back to the introduction of sheep in the Middle Neolithic until present day. Management practices of sheep include a wide variety of material culture, which is a result of primary and secondary product strategies, and spans textiles, architecture and the ecosystems of pastures. Activities linked to the procurement of these products are social activities, which create knots of sheep-human-materiality leading to embodied products and practices.

The project that will be presented in the paper examines and documents past practices of co-domestic human-sheep lifeways and deathways - how past societies and past human-sheep practices have interwoven sheep, materiality and humans in similar and different ways. The paper discusses how such perspectives might be implemented in Bronze Age and Migration Period case studies incorporating grazing regimes and textile work.

2 SHEEP AND POLITICAL ECONOMY: THE CASE OF THE TERRAMARA SITE OF MONTALE, NORTHERN ITALY

Author(s): Sabatini, Serena (University of Gothenburg)

Presentation Format: Oral

The aim of this paper is to assess characteristics and scale of pastoral economy and sheepherding at the Terramare settlement of Montale, Modena province, northern Italy. Previous studies have argued that Montale was the likely home of a Bronze Age centre of wool production. Evidence to such assumption to be found in the astonishing number of textile tools, in particular spindle whorls, documented at the site. The presence of large numbers of sheep/goats bones among the local faunal remains suggests that wool was the main manufactured fibre. The purpose of this paper is to contrast archaeological and archaeozoological data from the site's internal chronological sequence, with data from other neighbouring sites of the Po valley. It seems that Montale's wool economy might have played an essential role as to the local response to wider political, economic, and not least environmental transformations that distinguish rise, development, and collapse of the Bronze Age Terramare communities of the Po plain.

3 TEXTILE TOOLS FROM SURVEY DATA: WHAT CAN WE LEARN FROM THEM? A TEST STUDY FROM CENTRAL ITALY AND GREECE

Author(s): Fulminante, Francesca (Bristol University) - Farinetti, Emeri (University Roma Tre)

Presentation Format: Oral

Goal of this paper is to test a new approach to analyse textile tools from survey data and investigate its potential to provide a complementary perspective to that provided by site excavation and funerary data, to assess the value and spatial distribution of textile production.

We will use central Italy and central Greece as case studies and we test the association of textile tools with different type of contexts (urban vs rural) and different types of sites (primary centre, secondary, centre, villa, rural site, cult site etc.).

First, we will discuss the methodological issues linked to such an approach: can textile-related surface data be reliable? How can surface textile tools be dated and related to a particular phase of the site? Since they are usually low in number, can we rely on them as for the definition of site-function or the detection of patterns? At what extent is the record biased by post-depositional factors?

Secondly, we will present results of preliminary analyses by comparing two different regional case studies, central Italy and central Greece, in the wider context of other regional and/or local analyses. While there is a number of issues and limitations of a similar approach still some interesting trends can be detected.

Finally, we will evaluate potential issues and advantages of such an approach and its potential for future applications.

4 **TORN THREADS: FORGETTING TO TABLET WEAVE AND URBANIZATION AT GABII**

Author(s): Samuels, Jeffrey (University of Michigan)

Presentation Format: Oral

Studies of technological change in pre-Roman Italy have tended to focus on the adoption of new technologies and their relationship with concurrent socio-political changes. In this paper, I contend that it is equally fruitful to consider the disappearance of technological systems and the processes of social change embedded in the act of forgetting.

The Latin site of Gabii provides my primary case study for contextualizing the act of forgetting. Gabii provides a diachronic window into changes in textile technologies across Latium's urban boundary that have been noted anecdotally across the Italian peninsula but seldom investigated in depth. Recent excavations of multiple domestic complexes at Gabii have revealed evidence for changes in textile technologies as the site transitioned from a collection of proto-urban hut settlements to an orthogonally planned, walled "city". At Gabii, as at other Italian sites, specific textile-making tools and evidence for their attendant suite of production techniques (spools/rocchetti, bone tablets, and tablet weaving) are abundant in the pre-urban layers but disappear completely from all non-residual deposits belonging to the urban phases of the site.

This paper examines this point of disjunction in elite textile production. In addressing the question of why the Gabines "forgot" how to tablet-weave, I will argue that such considerations tell us much about both the generative role of tablet-weaving in proto-urban communities and the shifting social-networks of textile producers in the subsequent Sabine city. The material changes in textile production seen at Gabii after its "urban moment" can help us understand the changing roles elite men and women played as Italian communities moved from heterarchic, specialized, and household based pre-urban settlements to hierarchic cities.

5 **TEXTILE PRODUCTION AND LANGUAGE: CONNECTIONS AND TRANSFORMATIONS IN THE IRON AGE OF NORTH-EASTERN ITALY**

Author(s): Migliavacca, Mara (Università di Verona) - Marchesini, Simona (Alteritas)

Presentation Format: Oral

The paper aims to discuss a corpus of inscribed loom weights from the Iron Age settlement of Monte Loffa in the Verona mountains, providing an interesting connection between weaving and writing. The settlement was a central place in the organization of the mountain landscape of the Late Iron Age. Animal husbandry and weaving played a very important role at the site. Additionally, it is possible to hypothesise that particular fibres were specifically farmed for textile production.

The Raetic area, which covers roughly the central and eastern Alpine region, has given inscribed textile tools: needles, spools, spindles, whorls and loom weights. This paper focuses on possible connections among writing, weaving and social organization. Moreover, a comparison will be made with the neighbouring Venetic culture. It is argued that differences in textile tools are possibly to be understood as connected to the use of different fibres, and to the existence of a different social and political organization. Finally, an attempt will be made to trace economic and technological changes related to the Iron Age textile production in north-eastern Italy during the centuries.

359 **URBANITAS – EXPLORING URBAN WAYS OF LIFE IN THE PAST AND IN THE PRESENT**

Theme: Global change and archaeology

Organisers: Fulminante, Francesca (Bristol University) - Sabatini, Serena (University of Gothenburg)

Format: Regular session

Urbanism in the past and present remains hotly debated in academia and the media (e.g. Copenhagen Polis Centre project; Reception of the City in Late Antiquity ERC Cambridge project; UrbNet Aarhus project; Social Reactors Colorado Project; OIKOS Dutch network; Guardian Cities in the UK media). These primarily focus on city macro-structures, such as their political, social and economic organization and/or their monumental aspects.

They pay less attention to the experiences of the individuals and their well-being, which is also a measure of economic growth, despite that cities exist because of the individuals who live and work in them. With this session we aim to address the more intimate aspects of city life in developing urban contexts, exploring where and how people live, eat, travel, and interact. Uniting the past with the present, it asks explicitly:

- How does people's life change as communities become increasingly urban?
- What are the health differences between urban and rural populations and/or people of different social status?

Past developing urban contexts provide a diachronic laboratory to assess different socio-economic factors to determine how and why urban environments came into being, developed, flourished and collapsed (or not). Thus, they offer data and interpretations for policy makers and stakeholders today to address the Sustainable Cities and Healthy Communities challenges, two of the 17 global challenges set by the United Nations for a global sustainable development.

ABSTRACTS

- 1** **SHAHR-I-SOKHTE, A MIDDLE TO LATE BRONZE AGE PROTO-URBAN SETTLEMENT IN SISTAN, SOUTHEAST IRAN**

Author(s): Ebrahimiabareghi, Setareh (Institute of Archaeological Science, University of Bern) - Hafner, Albert (Institute of Archaeological Science, University of Bern; Oeschger Center for Climate Change Research, University of Bern)

Presentation Format: Oral

The Bronze Age in Southeast Iran lasted from the 3rd till the middle of 2nd millennium BC and has not been recognized in full potential in Iranian archaeological literature. There are massive amounts of discoveries from that period and region. However, the reason for the under-representation of the Bronze Age of South East Iran is the disparate evolution of Iranian research interests during the past 150 years onwards.

The region of Sistan has ever since been a suitable place in Bronze Age for human habitation due to the Hirmand river system and the fertile Ramroud river delta. From the 3rd millennium BC, onward many sites are established and prospered during the Bronze Age leading to early urbanization of specific important settlements. Trade and relations with regions in nowadays Afghanistan, Iran Baluchestan, Central Asia, Mesopotamia, and the Indus Valley are testified by shared cultural events and material culture.

The site of Shahr-i-sokhte, dating from 3200 till 1800 BC, is a good example of a proto-urban community in Sistan during the Bronze Age gaining a profound role in trade and exchange within its region and maintaining long-distance connections. In this paper, I will present significant characteristics of urban life in Shahr-i-sokhte, which can be distinguished into a residential and workshop quarter. Based on burial data the social stratification and the relations between common and aristocratic people will also be discussed. The interaction and relations to neighboring settlements and regions are of crucial importance to understand the rise and fall of Shahr-i-sokhte.
- 2** **LIFE-EXPECTANCY AND ECONOMIC GROWTH ASSESSING THE WELL-BEING OF PAST POPULATIONS WITH SETTLEMENT-SCALING THEORY (EARLY IRON AGE ITALY AND GERMANY)**

Author(s): Fulminante, Francesca (University Roma Tre) - Müller-Scheeßel, Nils (Christian-Albrechts-Universität zu Kiel)

Presentation Format: Oral

In this paper we propose to use life-expectancy as indicator of well-being and therefore of economic prosperity in past population. By using Early Iron Age Italy and Germany as case studies we test this novel approach.

Applying the R-package *mortAAR*, we use life-expectancy at different age-levels as indicator of economic growth and we test it by applying settlement scaling theory. This theory correlates settlement (or in our case burial community) size with economic outputs (e.g. GDP per capita and/or morbidity in our case). While the theory predicts that GDP per capita should scale supra-linearly with increased degree of urbanization it is more difficult to predict the relationship to mortality rates.

Before modern medicine there is some evidence that death rates were higher in larger cities, but also some evidence that people that survived contagious diseases in childhood, may have gained some immunity. In contemporary cities, larger cities have typically younger populations, because they attract professional age people, and often people retire away from them. In ancient cities we might expect an analogous situation, but it is hard to know the magnitude of these migration flows.

To conclude this paper will test and discuss issues and/or advantages of a new approach to identify the link between sustainable development, on one hand, and growth and health, on the other, hopefully to provide a new tool for wider comparative perspectives in urbanization and/or demographic studies.
- 3** **URBANISM AND ETHNICITY IN ANCIENT CENTRAL ITALY**

Author(s): Bradley, Guy (Cardiff)

Presentation Format: Oral

This proposal takes as a starting point Torelli's observation that archaic Rome, like the contemporary Etruscan centre of Volsinii, can be described as a frontier city. Cities in ancient central Italy emerge as places of interaction, meetings, and also mobility. Ancient cities are not like modern nation states, which might aspire to have monoethnic populations: well-known ancient examples include classical Athens with its metics and late Republican Rome with its substantial immigrant population. But the prehistory of this diversity is underestimated, and the pervasive mobility of urban populations is being increasingly appreciated. Archaeological and epigraphic evidence is revealing how mobility and migration are common for all social classes in cities such as archaic Rome, which emerge as places where separate ethnicities appear and perpetually interact. This talk considers what insights the archaeology of central Italian cities offers in this perspective, in terms of cities as living spaces, as bounded areas, and as permeable structures.
- 4** **THE TOWN AS A MEETING PLACE – DAILY LIFE AND INTERACTION IN MEDIEVAL COPENHAGEN**

Author(s): Dahlström, Hanna (Museum of Copenhagen)

Presentation Format: Oral

To study the town as a meeting place puts focus on the human experience of living in urban environments. It is a research focus

that is well known in the research field of modern urbanism but has not yet received much attention within medieval archaeology. The paper proposes that some of the social mechanisms associated with modern urban life might be valid also for life in medieval and ancient towns. This is discussed with material remains of daily life in the early phases of medieval Copenhagen, Denmark, as a point of departure. How would people living in the “new” town have experienced life there – was it different from rural life, and if so, in what ways? The increased social interfaces related to the practical conditions of living in medieval towns, such as economic specialisation, restricted living space, co-location and daily cooperation with strangers, are bound to have affected people in their daily routine of life, as well as psychologically. With Copenhagen as example, it will be proposed how archaeology, with tools from phenomenology and Social Practice Theory can use material culture to discuss how the social consequences of living in towns has been an important factor in the development of medieval urbanity.

5 THE ROLE OF THE ARCADES FOR EUROPEAN BURGHERS (13TH-18TH C.)

Author(s): Glinski, Radoslaw (University of Wrocław)

Presentation Format: Oral

In medieval European towns featured by high-density housing arose the crying need of additional well exposed space for trade and craft production. Therefore, the light weight wood constructions were installed to the front of the houses, protecting professional activity of their owners against weather conditions. Over time, such constructions took the form of arcades and began to inroach the public space, what resulted in inhibiting the praxis of their erection. Over the course of the 13th and 14th c., arcades spreaded over the large part of Europe, being employed also in the Early Modern times (i.a. France, Italy, Switzerland, Germany, Bohemia, Poland). Introduction of arcades had a huge impact on towns and town dwellers, being one of the results of urbanization, and this issue was seldom discussed by scholars. From the urban planning perspective, arcades brought changes in communication system, development of new trade passages, influenced towns’ aesthetic landscape and imposed the need for new regulations. Owing to arcades the town dweller gained a new half-private and half-public space. The arcades expanded the functional programme of the burgher house, providing additional work, trade or lease space, therefore increasing its economic potential. In addition to the new privileges, the town dwellers were also subject to new obligations connected with ensuring the appropriate form and maintainance of the arcades, as they served also as communication routes for all burghers.

This paper aims to present the grounds and consequences of erecting and demolishing the arcades from the perspective of both the whole town communities and individual town dwellers. It presents selected results of the project “Silesian arcade architecture in the European context (13th-18th c.)” financed by the National Science Center (project no. 2017/25 / N / HS2 / 01161).

6 BONE MINERAL DENSITY PATTERNS IN THE CONTEXT OF AN URBAN LIFESTYLE IN MEDIEVAL TRONDHEIM

Author(s): van Spelde, Anne-Marijn (Stockholm University; University of Copenhagen) - Kjellström, Anna - Lidén, Kerstin (Stockholm University)

Presentation Format: Oral

Medieval Trondheim is the subject of several ongoing and completed studies, particularly pertaining to the health and lifestyle of its population. The city was founded in 997 CE by Olav Tryggvason, and since then has served as the capital of Norway until 1217 CE and the seat of the Catholic Archdiocese of Nidaros (Trondheim) until the reformation in 1537 CE. It has experienced considerable fluctuations in population size, experiencing an all time low after the arrival of the Black Death in 1349 CE. Previous osteoarchaeological analysis on the Folkebibliotekstomten (or st. Olav) cemetery has identified changes in frequencies of lesions associated with physiological stress over time, and has found the urban settlement type to have a significant relation with bioarchaeological indicators of health. This poster will present bone mineral density (BMD) data gathered on the same collection using a peripheral quantitative CT (pQCT) scanner. Several paleopathological studies have already analysed the relation between BMD and lifestyle in past urban and rural populations in England, Norway and Italy. Data for the current study was collected from 88 adult individuals from the Folkebibliotekstomten dating between 1100 and 1650 CE. Patterns in BMD loss between age groups, sex, and throughout time will be assessed in connection to previous findings on health, to provide a better understanding of the demands of the urban lifestyle on the population of Medieval Trondheim.

7 UNIQUE EMBROIDERED ORNAMENTS ON HEADDRESSES OF URBAN RUSSIAN WOMEN THE 16TH-17TH CENTURIES

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

Presentation Format: Oral

During archaeological excavations at medieval Moscow necropolises remains of headdresses – hairnets – are found in female graves located in white-stone sarcophagi of the 16th-17th centuries. In medieval Russia every married woman had to wear such hairnet which was a very significant element of women’s traditional costume. Its ornamentation and even the color played an important informative and symbolic role in vestimentary communication. Each headdress consisted of a forehead band and a lace top.

The forehead band was usually made of red silk fabric and decorated with embroidery in gold, silver and colored silk threads. The embroidered ornament consisted of several stylized elements arranged in one horizontal line in a certain rhythm. On each point, there is necessarily a central element of the composition which is the «tree of life», symbolizing life, fertility and family. The

other elements are mirrored on both sides of central «tree of life» and arranged in decreasing order. There are several variants of compositions. Often only stylized «trees» are depicted. Usually there are 7 of them and each has axial symmetry. In some cases trees alternate with animals or birds. Animals (deer, lamb, wolf, as well as fantastic animals like unicorns) or birds (duck, rooster, peacock, and dove) are depicted in profile and create a rhythmic movement directed toward the center. Most often the composition consists of 5 «trees» and 4 animals or birds. Of particular interest are three forehead bands on which the «trees» alternate with complex dynamic animal combat scenes. Each hairnet is unique and is a fine example of Russian decorative and applied art.

8 PITCH BARRELS AND BELIEFS – EVERYDAY LIFE OF THE PIKISAARI PITCH MILL COMMUNITY IN EARLY MODERN TOWN OF OULU, FINLAND

Author(s): Hyttinen, Marika - Kallio-Seppä, Titta - Ylimaunu, Timo (University of Oulu)

Presentation Format: Oral

Since the 17th century pine tar and its derivative pitch were two vital commodities for building and maintenance of wooden sailing ships and thus, both substances were in great demand in global markets. Finland, at that time part of Swedish Kingdom, was rich in forest resources and quickly became an important producer of tar and pitch, which was made by boiling tar. The pitch cookery of the town of Oulu was established in 1640's and located on an offshore island, Pikisaari, just across the water from the urban area. The mill area was inhabited year-round by several pitch burners and their families, who formed a small and intimate industrial community. This paper investigates everyday life of the pitch mill community during the early modern time by analyzing material culture and archive materials. A synthesis of various sources has given a new insight into community's daily life in developing urban-industrial context. It seems, that although the processes of modernization, as well as urbanization started to impact the pitch mill community's day to day life, they still engaged with the traditional way of life fusing the early modern conceptions of the world to modern ones.

9 URBANISM, HEALTH AND PARKOUR: USING ARCHAEOLOGY TO EXPLORE THE BIOLOGICAL BENEFITS OF A GROWING URBAN DISCIPLINE IN EUROPE AND AFRICA

Author(s): Schulz, Ariadne (-) - Lebrasseur, Ophelie (Department of Archaeology, Classics and Egyptology, University of Liverpool)

Presentation Format: Oral

The emergence of cities c. 5000 years ago is a relatively recent phenomenon in the history of our species, yet these urban centres are now home to more than half of the world's population. Despite better access to healthcare, substantial concerns have been highlighted regarding the health impact associated with such rapid population growth in these geographically-restricted environments. One such health issue is the increase of biological stress usually developed as a result of circulating endemic diseases, periods of malnutrition, environmental changes and/or biomechanical stress. Another major health concern is that of mental illnesses which arise from a combination of social, psychological and biological factors, and interacts with physical health. An additional contributory factor to health lies in the design of urban centres: often crowded and busy, with imposing buildings and horizontal and vertical viewsheds, movement is often constrained not only by physical barriers such as passageways and walls, but also by the invisible delimitation resulting from the segregation of people into distinct neighbourhoods on the basis of ethnicity, gender, age and social status, all rooted in past events.

The concept of Parkour, a French discipline from the mid 1990s, is to move across the urban environment as quickly and effectively as possible. In this paper, we will combine bioarchaeology, anthropology, sociology and sport studies to assess the health and social benefit of parkour. We will first review the prevalence of biological stress markers and their causes in ancient urban and rural Europe and Africa. We will then compare it to modern data from parkour-practitioners (traceurs) and non-practitioners, paying particular attention to movement, social interactions and perceptions through time. Finally, we will conclude with some thoughts on how the past can help us understand the reasons underlying the health benefit of parkour.

A. (NOT) GROWING-UP IN THE CAPITAL

Author(s): Brindzaitė, Ruta (Durham University; Vilnius University) - Caffell, Anwen (Durham University)

Presentation Format: Poster

The 16th and 17th centuries in the Grand Duchy of Lithuania (GDL) were characterised by a period of intense political, economic and social decline. As if surviving wars, crop failures, and famine was not enough, growing-up became even more challenging. The bioarchaeology of children is becoming established in archaeology as a sensitive barometer of population health, yet limited research in this area has been carried out in Lithuania to date. This study compares Lithuanian populations living in urban and rural environments to examine whether differences in environment impacted on childhood growth and health. The urban sample (40 non-adults, 20 adults) derived from two cemeteries in the capital city Vilnius (Maironio str. and Subačiaus str.), while the rural sample (31 non-adults, 10 adults) was excavated from Ramybes str., Alytus, a small town the size of a large village, located 109 km to the south-west of the capital. Growth profiles (long bone length and vertebral dimensions) of urban and rural samples were compared, together with the prevalence of non-specific stress markers (dental enamel hypoplasia (DEH), cribra orbitalia, periosteal bone reactions) and frequency of metabolic disease (rickets and scurvy).

Possibly due to the limited sample size, significant differences were not observed between the two samples. However, palaeopathological analysis suggested that rural non-adults were exposed to more harmful life conditions than their urban peers.

Larger vertebral dimensions, which hint at lower levels of stress in infancy, and higher prevalence of DEH in the urban sample suggest that urban children possibly had better opportunities to survive and recover after stressful episodes. In times of turmoil, the whole population was affected and rural populations were as susceptible to health insults as urban communities. These data raise doubts about the conventional contrast between 'healthy' rural and 'unhealthy' urban living environments for children in the past.

360 IS ARCHAEOLOGY PRACTICAL?

Theme: Archaeological theory and methods beyond paradigms

Organisers: Alves - Ferreira, Joana (Centre of Studies in Archaeology, Arts and Heritage Sciences - CEAACP; University of Coimbra) - Vale, Ana - Barbosa, Helena (Transdisciplinary Research Centre: Culture, Space and Memory - CITCEM; University of Porto) - Lima, Leilane (MAE-USP, University of São Paulo)

Format: Regular session

Can archaeology become a place of resistance in terms of becoming-revolutionary and becoming-ethical?

In 1933, explicitly responding to Hitler's 'take-over of power', Vere Gordon Childe addressed the political reality of his time and asked: "Is Prehistory Practical?" Driven by his own unrest, he wrote that: "in 1933 it can hardly be alleged that Prehistory is a useless study, wholly remote from and irrelevant to practical life" (Childe 1933: 410), and it was by addressing his reality – his actuality – that he pointed to the political and ethical conditions of archaeology's place in contemporaneity. Thus, the issue raised in "Is Prehistory Practical?" encompasses not only resistance to the present but both the diagnosis of archaeology's inadequacy when facing its time and the creative prognosis for its actual becoming-other, even if that is uncertain. Whether in 1933 or now, Childe's question points towards the thought of resistance as a response that is both political and ethical.

The thought of resistance resists representation as it is not simply the inverted image of power, and neither embodies a form of non-power, or is radically liberating. Resistance is a mode of existence: becoming-always and already. Resistance is an act of creation: political, ontological, aesthetical and ethical. Therefore, resistance is an inventive practice of new knowledge and meanings yet to come via diversity, multiplicity and the destruction of identity as representation. Resistance is untimely. In this sense, how can we make archaeology practical? How can we respond as present-becoming? How can we make it untimely?

We are interested in critically approaching archaeology as a place for practical invention. As an always-experimental process of learning, in which materials from the past are an endless source of knowing and acting upon our historical conditions. We encourage contributions from different theoretical and political perspectives, and distinct chronologies.

ABSTRACTS

1 IS ARCHAEOLOGY PRACTICAL? AN INTRODUCTION

Author(s): Alves - Ferreira, Joana (CEAACP - University of Coimbra) - Vale, Ana (FCT-Post-Doctoral Researcher; CITCEM - University of Porto) - Barbosa, Helena (FCT Doctoral Researcher; CITCEM - University of Porto) - Lima, Leilane (MAE-USP; University of Sao Paulo)

Presentation Format: Oral

This session was conceived at a critical moment. Due to a global humanitarian crisis, the contemporary political space is defined by abandonment and by exodus. Thousands of faces are on the run, lost in the uncertainty of uncertain movements: nomads, migrants, refugees, displaced, abandoned, anonymous. The contemporary political space has been framed as a state of exception, which, on a global scale, defines the places of power through the bio-political marking of the territory. In broad perspective, politics as a practice of exception stimulates the spread of the crisis in democracy with the erosion of democratic ethics and values as it promotes the rise of conservative and authoritarian policies, the reiteration of racism and of practices of segregation.

This introduction aims to outline the grounds on which the session was conceived as well as to present some of the theoretical concepts upon which the conditions for its political and ethical possibilities are based. As such, it intends to counter-actualise the question originally posed by Gordon Childe in 1933, "Is Prehistory Practical?", which concerned the utility and liability of prehistoric archaeology in everyday life. Thus, when asking Childe's question we challenge archaeology's place in contemporaneity so as to creatively learn how to enunciate the evidence of becoming – 'what could be' – as the places where other choices can be made. We will explore archaeology as a place for practical invention and its potentiality for both affecting and effecting changes on the discipline.

Finally, in addition to presenting the structure of the session, it will seek to bring together the different perspectives of both the organisers and of each contributor, defining shared concepts such as resistance and intervention, social justice and equality, politics and practicality, hoping to promote the debate and dialogue between the different case studies presented in the session.

2 ARCHAEOLOGY AND ITS REDISTRIBUTIONS. AND YET IT MOVES!

Author(s): Gomes, Sergio (CEAACP - University of Coimbra) - Gameiro, Cristina (UNIARQ - University of Lisbon) - Nóbrega, Pedro (Sever do Vouga Museum; IEM-NOVA FCSH)

Presentation Format: Oral

The study of past remains is a work of redistribution, demanding the mobilization of things, people and ideas and the construction of new spaces for the entities emerging in this process (De Certeau 1982; Lucas 2012). As such, archaeological research is a place of practical invention: recreating the conditions for past remains to exist in the present; transforming the conditions in which archaeologists and other communities work and live together. Archaeology is an ecology of practices in which the care of things activates the care of other agents (Olsen et al 2012). This paper will focus on the dynamics of the research in which three prehistoric sites located in the Vouga river valley (Portugal) were studied. The study is now being undertaken by teams working in preventive/commercial archaeology, research-oriented archaeology and heritage management services. However, at the beginning of the project, these dynamics were different. A conflict of interests – inherent in how preventive/commercial archaeology has been managed in Portugal – was creating a circuit of social/economic and research exclusion, leading to adverse working contexts for archaeologists. To combat this, more agents were needed to be added to the process in order to enlarge the possibility of studying the sites. In discussing this, we will emphasize how the economic and social conditions framing archaeological research create circuits of exclusion/inclusion and how archaeologists – as ethical and political agents – may act upon those conditions; resisting to, and transforming, the circuits in which they become archaeologists.

De Certeau, M. (1988), *The Writing of History*, trans. Tom Conley, New York: Columbia University Press.

Lucas, G. (2012), *Understanding the Archaeological Record*, New York: Cambridge University Press.

Olsen, B., M. Shanks, T. Webmoor and C. Witmore, (2012), *Archaeology. The Discipline of Things*, Berkeley: University of California Press.

3 ARCHEOLOGY AS A METHOD OF STRUGGLE AND STRUGGLE FOR ARCHEOLOGY

Author(s): Lerma Guijarro, Alma (Complutense University of Madrid; CRAS - Revolutionary Center of Social Archaeology; Palimpsests: anarchist archaeology and anthropology magazine; Backset Archaeology association)

Presentation Format: Oral

Archaeology is useful to address current issues in many ways. On a theoretical level there are different ideological standpoints when researching the subject: political perspectives on archaeology, such as anarchist archaeology, feminist archaeology, queer archaeology, etc.

However, to make forgotten people visible, we need projects at a practical level too. In my presentation I want to highlight two examples of such archaeological resistance:

1. The work that CRAS (Revolutionary Center of Social Archaeology) is carrying out, especially at a feminist level with exhibitions and archaeological activism with the objective of saving our heritage from companies that want to destroy archaeological sites to build supermarkets, roads, etc.

2. The special case of how archaeology can serve as a form of rural resistance. Fraguas is a repopulated hamlet in Guadalajara (Spain) which was occupied and rebuilt by young people in accordance with the traditional architecture of the area. According to the law, they could be prosecuted and sentenced to 26 years in prison for squatting in an alleged forest area which has never been inhabited, however, the Backset Archaeology Association studied one of the buildings, a church, to justify that Fraguas was a village which was abandoned in 1968, so it could not be classified as a forest area. Due to this archaeological research, the occupiers sentence may be reduced.

4 A NEW ARCHEOLOGICAL “APPROACH” THAT CAME FROM THE SOUTH: THE BRAZILIAN CASE

Author(s): Rocha da Costa, Maria Clara (Porto University)

Presentation Format: Oral

Since the 2008 global crisis, it was noticed the raise of a conservative centred on behavioural patterns coupled with an overpowering neoliberalism. The extreme-right parties of some European countries, such as Hungary, Poland and Italy, and more recently in Brazil are demanding new approach for the Universities and their role in the society. It was observed that anti-intellectual and anti-cultural movements are now aligned with the extreme-rights governments. Dealing with serious problems related to the scrapping of the cultural sector since 2016, the stance taken by Brazilian Archaeologists was strength the relationship with popular social movements. The impact of this threatening in Archaeology profession and, in consequence, the archaeological heritage preservation forced the only path to take: the use of Archaeology as a tool of political struggles and recognition of minority groups. An example of this new approach is the work of Brazilian Archaeologists in the so called “Truth Commission”. It aims to recover and identify “political disappeared” during the dictatorial period and return to their families to appropriate burial. Nowadays, there is also some development of collaborative archaeology projects in Brazil, in which were established two-way communication between the Archaeologists and the population; important to mention that these projects value the popular knowledge. The 21st century Archaeology is no longer only within the Universities camps nor in archaeological sites, but mainly in museums, schools, Indians villages and suburbs outside great cities. Nowadays Archaeologists role in much more than looks and care about past materials, the professional must understand and be integrated in others disciplines that will help them to

preserve the heritage and knowledge from those who came before us. This communication aims to approach the political actions of Archaeology in Brazil at the current time using critical analyse and description methodologies.

5 STARQ - THE CASE OF THE PORTUGUESE TRADE UNION FOR ARCHAEOLOGISTS

Author(s): Simões, Sara (Cambridge Archaeological Unit, University of Cambridge; STARQ - Sindicato dos Trabalhadores de Arqueologia) - Barbosa, Regis (STARQ - Sindicato dos Trabalhadores de Arqueologia) - Bugalhão, Jacinta (STARQ - Sindicato dos Trabalhadores de Arqueologia; UNIARQ - Centro de Arqueologia da Universidade de Lisboa, Faculdade de Letras; Centro de Estudos em Arqueologia, Artes e Ciências do Património) - de Carvalho, Liliana (STARQ - Sindicato dos Trabalhadores de Arqueologia; CIAS - Centro de Antropologia e Saúde, Department of Life Sciences, University of Coimbra) - Peace, Richard (STARQ - Sindicato dos Trabalhadores de Arqueologia)

Presentation Format: Oral

The Sindicato dos Trabalhadores de Arqueologia - STARQ - is a nonpartisan union formed in 2012, in order to uphold the rights of archaeology and heritage workers in Portugal.

STARQ bases its conduct on the conviction that archaeological practise is not, and can never be, independent from social and political contexts in which it is carried out. This is a professional sector which is characterized by a high degree of job instability in the private sector and a lack of government funding in the public one. This is the result of the crippling austerity policies enforced in the country during these last years. Even with the latest changes in government, state investment in Culture, a sector in which the public management of cultural heritage is included, remains at extremely low levels.

The union in of itself has facilitated working conditions by not only maintaining dialogue between actors, but also through actions in court. However, it is also essential to pursue initiatives that guarantee greater democratization of access to archaeological goods by the population, other than their consumption as market goods. One of STARQ's concerns is also the fight against the "commodifying" of cultural heritage occurred in large urban centers and in rural areas all over the country.

In this sense, we intend to reflect upon how the very existence of a union and its action represent a space of resistance and social activism. How does the defense of heritage and its workers influence the way archaeological practices take place? How can the interpretations that archaeologists make of their subject matter create a more ethical activity? In short, how can resistance make archaeology more balanced in its relations and a more democratic and egalitarian activity?

6 IS BLUE OR PINK? ARCHAEOLOGY AND PORTUGUESE SOCIETY IN THE 60S AND THE 70S: A PAST CONTINUOUS

Author(s): Martins, Ana Cristina (IHC-NOVA FCSH / UÉvora / FCT; Uniarq-ULisboa; InterArq Project, Universitat de Barcelona)

Presentation Format: Oral

Despite living in the 'Estado Novo' ('New State'), during the 1960s a succession of internal and external political episodes justified public demonstrations - especially student ones -, against the political regime in force for several decades. Like any other science, archaeology was not untouched by this movement, and it tried to innovate in teaching, bibliographical access, training abroad, interpretation and the presentation of data collected in the field and examined in the laboratory.

Some of these aspects have already begun to be analyzed by those who devote themselves to the history of archaeology. Others, however, are only beginning to be studied now, like the subject of women in archaeology. It is in this sense that we propose to examine how the feminine element has been presented in these two decades in archaeological narratives - written and iconographic -, in order to understand how the social model prevailing at the time was transcribed in and reinforced by them, and to what extent archaeologists and the public were aware of this process. Last but not least, we will try to compare the reality found in primary and secondary sources to that observed today, reflecting on the role of archaeology in education for citizenship and equality.

7 GENDER ARCHAEOLOGY AND THE POLITICS OF THE DISCIPLINE

Author(s): Vale, Ana (University of Porto - CITCEM)

Presentation Format: Oral

Have gender studies succeeded in creating or participating in discourses of resistance within archaeology or are they part of the counter-discourse necessary to validate the current androcentric narrative? Can gender studies be a subversive framework, or (auto)critical inspiration (after Bourdieu, 1998), within archaeology.

Many studies, while rendering "women" visible, continue to define them by their association with domestic tasks. And although the private (the house) has been lit up and the discussion of gender preconceptions forced into the public, the traditional architectural dichotomy still sustains the social norms of male dominance. Also, within prehistory, the link between biological sex and gender is difficult to undo, gender being intertwined with the duality of biological sex. As such, we are forced to ask the question, is it possible to reach gender beyond biological sex, insofar as it is in permanent construction and dependent on interpersonal relationships? Or is it just another category that limits our interpretation?

This paper aims to question the repercussions of gender studies in Prehistory, with special focus on Iberian Late Prehistory, and to re-evaluate the concept of gender in the production of discourses must be more inclusive, responsible and fair to the otherness of the prehistoric past, taking into account the questions raised above.

8 GENDER, SEX AND ARCHAEOLOGY IN TIMES OF WRATH

Author(s): Gomes, Francisco (UNIARQ - Centre for Archeology of the University of Lisbon; School of Arts and Humanities of the University of Lisbon; Foundation for Science and Technology)

Presentation Format: Oral

One of the many faces of the changing global political climate in the past few years has been the backlash against the social progresses achieved in the matter of both woman's rights and the rights of LGBTQ+ individuals. Neo-conservative, populist and far-right political movements have deployed the narrative of "gender ideology" as a resource to mobilize their social and electoral bases around a reactionary view of gender and sexuality which threatens to undo decades of advancement towards greater equality and a fairer and more open society. The Social Sciences and the Humanities, which helped to achieve those progresses by offering a theoretical underpinning to social movements and grassroots activism, have been directly targeted by this backlash but have also become an active field of resistance against it.

Despite a certain epistemological marginalization within this wider knowledge field, Archaeology has a clear potential to make theoretical and practical contributions to this discussion. The experience of Feminist and Gender Archaeology with standpoint theory and "strong objectivity" can certainly be useful in building defenses against the rise of "post-truth". Furthermore, its wide geographical and chronological scope make it a privileged field to explore the historical construction of gender and sexual norms, a key task if the essentialism and appeal to tradition underpinning current reactionary narratives are to be critically deconstructed.

However, to do so, Archaeology needs to shed a certain reluctance regarding socio-political engagement, as well as to exploit its clear interdisciplinary vocation in a more proactive way, endeavoring to make active contributions to on-going discussion rather than just draw from them.

9 HOW CAN WE DECOLONIZE EUROPEAN ARCHAEOLOGY?

Author(s): Gomes Coelho, Rui (Cultural Heritage and Preservation Studies, Rutgers University) - Simões, Sara (Cambridge Archaeological Unit, University of Cambridge)

Presentation Format: Oral

In recent decades, many archaeologists have called out for the decolonization of archaeology as a scientific discipline and as a social practice. These calls recognize that knowledge production is contingent on power relations and that, historically, archaeology emerged as a practice at the service of colonialism and nationalism. The decolonization of archaeology has shown that there are other histories to tell about groups and events that were traditionally relegated to the margins of knowledge and power and that, by doing so, archaeology became a tool of social justice. However, the conversation about the decolonization of archaeology in Europe has been marginalized as well. In this paper, we will discuss the need to decolonize European archaeology. We will use three case-studies from Portugal, which simultaneously show the need to decolonize archaeology and the social possibilities that arise from the process. The cases are: the deconstruction of power relations within the profession, the study of slavery, and the emergence of contemporary archaeology in the context of the current European humanitarian crisis.

10 ELECTIVE AFFINITIES: THE PRAXIS OF BECOMING, REVOLUTIONARY PESSIMISM AND RESISTANCE

Author(s): Alves - Ferreira, Joana (CEAAC, University of Coimbra)

Presentation Format: Oral

"Nothing is more foreign to the melancholic revolutionary than a paralyzing faith in inevitable progress and guaranteed future. Although they are pessimists, they refuse to surrender, to give in. Their utopia is the principle of resistance to inevitable catastrophe." (Löwy 2009: 10)

The proposition of this session opens on a double question: "Is Archaeology Practical? to which follows "Can Archaeology become a place of resistance in terms of becoming revolutionary and becoming ethical?" The two questions are closely linked and both aspire to, and create, the possibility of transformation. In other words, the praxis of "becoming-other".

To address and respond to the demands required by those questions we aim to suggest links of elective affinities that can be drawn between Gilles Deleuze's concept of becoming, Walter Benjamin's active - 'organized' - practical pessimism, Rosa Luxemburg's "Socialism or Barbarism" formula, along with Gordon Childe's archaeological thought of revolutionary change.

For Deleuze the concept of becoming is both the creative force and the actual practice for mediating a dynamic event across different temporalities and different geographies. It is then an inventive practice of the creation of new concepts and meanings - that are yet to come - as the praxis of 'what could be' and therefore as future-oriented ethics.

For this purpose, to mark the 100th anniversary of her brutal murder, we recall Rosa Luxemburg's revolutionary formula - Socialism or Barbarism - which dialectically interrupts the inevitability of the process of historical evolution, opening the possibility for other-stories as other-choices to be negotiated, while seeking to creatively perform a dialogue with Childe's notion of revolutionary change as the praxis for creating discontinuity - interruption and possibility - in the continuum of the historical fabric. In the background, "pessimism all along the line". The way Benjamin defined to prevent us from withering away.

11 RATIONAL, EMPIRICAL AND ROMANTIC PREHISTORIES

Author(s): Thomas, Julian (Archaeology, University of Manchester)

Presentation Format: Oral

At a critical moment in European history, Gordon Childe reflected that "it can hardly be alleged that Prehistory is a useless study", since it was within this discipline that theories of racial identity and population history were constructed and contested. As he noted, "in the name of these theories men are being exiled from public life and shut up in concentration camps". By an unfortunate coincidence, the return of racism and authoritarianism to European politics coincides with a renewed interest in massive population movements. In the 1990s, Andrew Sherratt introduced an influential interpretation of the development of archaeological thought, in which the discipline lurched between episodes of Enlightenment rationalism and Romanticism. One argument is that notions of 'peoples' as homogeneous expressive totalities can be attributed to the latter. Accepting the value of Sherratt's argument, I seek to modify it, by suggesting that the essential tension in the history of archaeology has been between empiricism and rationalism. As Isaiah Berlin observes, totalitarianism is as likely to emerge from an excess of rationality as from Romanticism.

361 RECONNECTING THE INTERPLAY OF FORTIFICATIONS AND RELIGIOUS BUILDINGS WITHIN THEIR LANDSCAPES: CASTLES, MONASTERIES AND CHURCHES RE-EXAMINED

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Blaich, Markus C. (State Service for Heritage Management) - Swallow, Rachel (University of Chester)

Format: Regular session

Castles and fortified residences are too often researched separately from their associated religious holdings: monasteries, abbeys, churches, hospital foundations, monuments such as stone crosses, and landholdings. Rarely do we find a full examination of the interplay of the social, political, commercial, architectural and symbolic influences between the generally inter-dependent powers of the secular and religious within their settlements and landscapes.

Pushing beyond the paradigms established by previous research, this session aims to explore the contemporary relevance, or otherwise, of fortifications and their associated religious buildings. Only by examining the wider context of landscape, archaeological, architectural, historical and place-name evidence, can the joint secular and religious powers be hoped to be fully understood within their administrative and political landscapes. It is recognised that such secular-religious configurations in the landscape, and their resultant interpretations, will not be the same in all European countries; this is therefore a further and fundamental premise for collaborative research and discussion.

This session aims to provide a valuable contribution to future multidisciplinary research, where the reconnection of the contemporary significance of fortified and religious landscapes is examined. Papers are invited, of case studies which take multi-disciplinary, multi-period and methodological approaches. The intention is to provide a platform for on-going discussion, that

- explores research approaches and discoveries focusing on fortified and religious communities
- debates issues relating to the preservation and restoration of monuments or landscape features relevant to the theme of this session
- encourages debate on the similarities and differences of secular and religious communities between countries.

ABSTRACTS

1 CASTLE, WALLS AND CHURCHES. FORTIFIED AND RELIGIOUS LANDSCAPES IN MEDIEVAL AND EARLY MODERN ALMADA (PORTUGAL)

Author(s): Casimiro, Tania (IHC/IAP NOVA University of Lisbon) - Tavares, Telma - Reis, Ana Beatriz (FCSH NOVA University of Lisbon)

Presentation Format: Oral

Almada was a medieval fortified village located in the south bank of the Tagus River opposite to Lisbon. Although the area is occupied since pre-historic times only in the 11th century there is news of a fortification. Not that much is known from this initial period, however, in the 13th century, after the Christian Reconquista it is already a fortified village with at least two churches, a number which will increase in the following centuries with news of additional churches within its walls and several religious buildings (churches, monasteries and hospitals). This panorama will be consistent until 1755 when an earthquake destroys a large portion of the village.

This paper aims to discuss the urban organization of this village in medieval and early modern times relating its castle, city walls and religious buildings and how urban organization choices were made having in mind military, political and religious powers. The presence of these buildings still shapes the urban organization of the area today. On the other hand we will try to understand the role of this village in a more widespread zone locating other religious houses and churches in the nearby areas outside the city walls, discussing how were all of these buildings related and how did they influence the landscape of that area.

2 CENTRES OF POWER AND CENTRES OF CHRISTIAN FAITH IN SLAVIC TERRITORY – INTERPLAY OF FORTIFICATIONS AND MONASTERIES IN UCKERMARK REGION

Author(s): Biermann, Felix (Greifswald University)

Presentation Format: Oral

Together with the great transformations of 12th/early 13th centuries in the north-western Slavic lands (nowadays North-Eastern Germany), including Christian mission in until then pagan tribal areas of the Lutician league, the first monasteries emerged. In still not fully christianised lands and sometimes troubled atmosphere, these monasteries were founded often in the shelter of princely strongholds, often also near early urban fortified centres to develop religious and political influence. The location of the monasteries depended on the character of the order, on its specific mission and also on the time of foundation, because religious and political affairs in these times rapidly changed. Thus, there was a very specific relation between the strongholds as centres of power and the monasteries as centres of Christian faith in nowadays North-Eastern Germany. This relation is studied based on archaeological and historical approaches, focussing on Uckermark region in Brandenburg (the former area of Slavic Ukraine tribe, afterwards Pomeranian duchy) and the relation of Fergitz island stronghold and Cistercian Nuns monastery of Seehausen in 12th/13th century.

3 CISTERCIAN MONASTERIES IN LOWER SAXONY AND THEIR INTERPLAY WITHIN THEIR LANDSCAPE

Author(s): Blaich, Markus C. (Lower Saxony State Service for Heritage Management)

Presentation Format: Oral

In Lower Saxony there are about fifteen large Cistercian monasteries, some of which were very influential in the Middle Ages and even beyond the region. Examples are Amelungsborn, Hude, Ihlow, Loccum, Riddagshausen and Walkenried.

The amount of research carried out thus far on these monasteries varies considerably: from modern archaeological excavations with differing degrees of site coverage, to architectural or individual building survey. Consideration of the integration of the monasteries within their surrounding landscapes has only been analysed to a very limited extent.

This paper provides an overview of the research carried out to date and - based on the results obtained - pays tribute to the paradigms of this work. Considering the perspectives of a landscape archaeological investigation for the first time, however, the monasteries of Amelungsborn, Loccum and Walkenried will be discussed. The paper focuses on the build of the monasteries in relation to pre-existing settlement structures, and to what extent, if at all, these structures were used in the foundation of the monasteries.

4 THERE'S SOMETHING ABOUT MARY: MARIAN CHURCH DEDICATIONS AND MEDIEVAL CASTLE FOUNDATIONS IN ENGLAND AND WALES

Author(s): Swallow, Rachel (University of Chester)

Presentation Format: Oral

It is fifteen years since Wheatley (2004: The Idea of the Castle in Medieval England) highlighted a theoretical link between the bishopric church of St Mary's and castle at Lincoln, England: Documents place consistent emphasis on the Marian associations of the church, showing that contemporary observers perceived it as a Castle of the Virgin. The close relationship between the new bishopric and the castle at Lincoln is emphasised by the bishop's duty to provide the castle guard from the foundation of the bishopric until the 1130s. This Marian-fortification link points to a learned association between certain military/ecclesiastical architectural elements of the church and castle and their Marian exegesis. The link does not appear to have received further academic attention until now.

Research indicates that an overwhelming majority of presumed early-build Norman castles on the northern Anglo-Welsh border of Cheshire and north-east Wales are associated with churches dedicated to St Mary, the Marian dedication being widespread by the beginning of the eighth century. By the mid-fourteenth century, the Mary-centric Carmelites (White Friars) appear to have affected Royal support, endowments, and in turn, the design of castles in the same geographical area; this is argued to be evident particularly in the architecture of Denbigh Castle in north Wales.

This paper briefly explores three main questions for ongoing and potential research in a wider spatial and temporal context:

- Is there evidence to support the theory (introduced in this paper), that Norman castles built alongside/within the precincts of (pre-existing?) churches of Marian dedication are likely to have been founded immediately post-Conquest upon a pre-existing place of associated secular power?
- Is there any correlation between the uses of defensive architectural elements (such as crenellations) in an ecclesiastical context, with Marian dedications?
- To what extent did Marian reverence and church dedication influence the architecture of castles?

5 FORMS AND TYPOLOGY OF THE FORTIFIED CHURCHES IN EUROPE

Author(s): Cechura, Martin (The Museum of West Bohemia in Pilsen)

Presentation Format: Oral

This contribution introduces differences and parallels in the construction forms of the fortified churches in European regions. Special attention will be paid to the comparison between fortified churches in Central Europe and Iberian Peninsula. These

churches serviced not only for the Christian liturgy, but they functioned additionally as a place of the active defence, a place where people found protection during wars or local fights in their region. In some churches were also specially constructed places for the hiding of the rare and expensive objects or keeping guns for example in towers.

This presentation will show also different elements of the defence, which should be divided to two main groups – active and passive. The first group includes loophole, to the second group belong for example walls and towers with gates or fortress moats. Other components are related to the construction of the church itself as narrow windows, massive walls, bolts in the church doors.

This topic is not very often reflected in the research, although it is crucial for the proper knowledge of all types of the military architecture in the Middle Age in Europe.

6 AS GOOD AS A CASTLE: THE FORTIFIED CHURCHES IN TRANSYLVANIA

Author(s): Istrate, Daniela Veronica (Institutul de Arheologie Vasile Pârvan, București)

Presentation Format: Oral

Transylvania (central-western Romania) retains a considerable treasure of fortified churches scattered throughout its territory. Religious spaces combined with elements of fortification had already appeared in the 11th-12th, but most of the fortified churches were completed or built in the 15th-16th centuries. This phenomenon was not entirely unique in medieval Europe, as similar isolated structures were erected in various other places, but nowhere did it reach the same magnitude as in Transylvania. This situation may be explained by the position of this province on the eastern side of the Carpathian basin, at the forefront of Tatar and, then, Ottoman attacks.

From the outside a fortress, from the inside a church and, most often than not, a Romanesque or a Gothic jewel: the characteristics of a fortified church may reveal such a stark contrast between them that they surprise not only visitors, but also specialists who attempt to reconstruct the history of these architectural monuments.

This paper will give an overview of fortified churches in south-eastern Europe, examining the phenomenon in a broader context.

A. RESEARCH OF THE WEST PART OF KÖNIGSBERG CASTLE

Author(s): Khokhlov, Alexandr (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Poster

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 in near 1790 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 cultural layer 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.

A rectangular building and round towers were found here: two towers of large diameter on the side of the moat and two towers of small diameter for the stairs on the side of the courtyard. 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.

365 MANAGING (MASS) TOURISM AT HERITAGE ATTRACTIONS (SITES AND MUSEUMS): HOW DO WE BRIDGE THE GAP?

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers: Bedin, Edoardo (Arheoloski Muzej u Zagrebu; National Trust) - Balco, William (University of North Georgia) - Megale, Carolina (Past in Progress) - De Vivo, Caterina (Madeculture)

Format: Regular session

Heritage – and its future – has become embedded with (mass) tourism, where it is now granted the importance of public outreach by raising awareness of heritage and generating income to preserve it for present and future generations. Higher numbers of tourists visiting leading sites and museums has highlighted the great stress placed upon those very few sites and museums. Despite these stresses, national, regional and local governments often praise heritage attractions capable of increasing annual numbers of visitors. Consequently, stretching visitor capacities leads to the deterioration of those very sites and museums that official institutions are supposed to preserve. Such practices suggest that visitor numbers serve as a measure of success: the higher the better, but at what cost to heritage?

We are facing a dilemma: heritage needs tourism – well-managed mass tourism – to live on and be preserved as it generates the necessary funding upon which conservation relies. Likewise, it needs to find ways to develop damage control policies against tourism related threats such as site erosion, cultural exploitation, unsupervised commercialisation, heritage trivialisation.

Therefore, this session explores evidence of tourism threats at heritage attractions, focusing on policies established to mitigate those threats, strategies to enhance visitor experiences, and generating income to support the institution, museum, or site. Consequently, site management strategies and conservation policies will be addressed, exploring how tourism can be managed in an effective manner, possibly by involving local and national institutions, local communities, academic institutions, and local/regional/national businesses. Contributors will address methodologies employed in various sites to manage tourism at heritage sites as well as present issues caused by tourism and solutions to transform tourism from a threat to the future of heritage to a valuable resource capable of enhancing financial sustainability and enabling preservation for future generations while maintaining exceptionally high standards of visitor experience.

ABSTRACTS

1 SUSTAINABLE HERITAGE TOURISM : STRATEGIES, OPPORTUNITIES AND CHALLENGES

Author(s): Basu, Asmita (Army Institute of Management; NIT, Durgapur)

Presentation Format: Oral

Tourism has been considered as a stimulant for economic re-generation and conservation of any region. The environment of any region can be rapidly changed or damaged by external factors and tourism can be a powerful agent for such a change. Such detrimental effects are of immense concern because of the role the region may play as repositories of natural and historical heritages.

It is essentially a big challenge to attract the tourists to heritage sites without damaging them. Some heritage tourism sites also find difficulties in raising funds for their maintenance and sustenance. Moreover, the community residing in and around the heritage sites often neglect the importance of the sites. These growing issues require special attention thereby indicating the formulation of proper strategies for improving the cultural heritage and history that can have a good benefit for the wider community. In order to make the concept of sustainability in heritage tourism a success, it must be a multi-faceted framework. Thus, research needs to be done in order to manage the cultural heritage and to achieve optimal results.

In the present scenario sustainable tourism has become an important challenge to deal with particularly in the age of modernization. Conventional tourism plans are dominated by the growth requirements of the tourism industry while sustainable tourism plans are based on a wider, more holistic and regional analysis.

To understand the scope and reach of sustainable heritage tourism, a case study of Bishnupur in Bankura district in eastern India has been chosen. The present study aims to highlight the strategies, opportunities and challenges for developing sustainable tourism specifically in the heritage sites through this case study. The materials have been collected through the field work in this region. Some important but lesser known heritage sites have been selected for this study.

2 IS MASS TOURISM A THREAT? AN OVERVIEW OF THE BRITISH SITE NETWORK SYSTEM TO MANAGE TOURISM FLOW

Author(s): Bedin, Edoardo (Arheološki muzej u Zagrebu; National Trust for Scotland)

Presentation Format: Oral

39.2 million overseas visitors who came to the UK in 2017 spent £24.5 billion – both setting records. These figures represent a 4% increase in volume and 9% (nominal) increase in value compared with 2016.

The National Trust of England, Wales and Northern Ireland had 26.6m visitors in 2017/18 and reached 5.2m members while in 1970s there were only 270,000 visitors, while the National Trust for Scotland had 2,480,000 visitors to its properties in 2014/15 and 330,000 members joined this charity. The number of people employed by these two conservation charities is over 10,000 and over 65,000 volunteers contribute to the upkeep of British heritage.

Any site in the care of these two charities can be at risk of mass tourism exploitation – especially flagship sites such as Stonehenge – however both charities rely on a site network operational system which encourages visitors to widen their interests and therefore enable to absorb this high number of visitors. The risks are mitigated locally and regionally by promoting on-site and off-site not only flagship sites but also satellite sites that can thus benefit from the presence of well-known nearby sites.

This paper is going to explore the operational system adopted by the National Trust for Scotland and the National Trust, investigating pros and cons of a centralised operational model, focusing on the financial sustainability, the conservation risk, benefits to local communities, and whether it is acceptable to consider visitor numbers and high revenues as parameters of a successful season.

3 THE ARCHAEOLOGICAL TOURISM IN POLAND – THREATS AND OPPORTUNITIES (CASE STUDY)

Author(s): Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)

Presentation Format: Oral

The new tourism formula called 3 x E (Entertainment, Excitement, Education) applies also to cultural tourism, the main tourists destination are monuments and museums, including archaeological sites. Activities aimed at raising awareness of heritage, cause that archaeological attractions are increasingly visited by tourists. However, this trend has its advantages and disad-

vantages. The growing number of tourists motivates the managers of the monument to further actions, in accordance with the principle the appetite grows with what it feeds on. The fact that more and more often archaeological sites are treated as places to generate profits can cause irreversible damage to the site.

Archaeological sites are of interest to many groups. The perception of its the value and the way of management depends on the point of view. For a researcher (not just archaeologists) the most important is obtaining as much scientific data as possible. For museums the priority is to get as many visitors as possible. For an archaeological site manager (eg. local government) the most important is an effective spatial development. The tourist expects information and entertainment. In such situation protection of the archaeological heritage is very difficult. Different expectations and the lack of dialogue between the representatives of particular groups contributes to conflict situations, when the archaeological heritage most often suffers losses. The priority of archaeological heritage management should be primarily the preservation of authentic structures. The educational factor cannot be overestimated for protection. I would like to present a few examples of archaeological sites, that attract hundreds of thousands of visitors. I would like to analyze what impact the tourism has had on the state of preservation, landscape and cognitive values of those sites and whether the success of the museum was not too destructive to the archaeological site.

4 THE DEVELOPMENT OF CULTURAL ROUTES IN GREECE. CONNECTION BETWEEN MUSEUMS & CULTURAL ROUTES

Author(s): Kosta, Elissavet (Ionian University)

Presentation Format: Oral

In our research, we will to propose the methodology which is required for the planning of the cultural route in order to prepare substantiated proposals for the development and planning of cultural routes in Greece in the near future. The innovation of our research lies in the placement of the museum in the cultural route and especially the connection and the co-operation between them, as well as how the museum can comprise the terminal station of the cultural route.

The cultural route is defined as a brand name touristic product, that is a product of cultural tourism, which is shaped according to a specific connecting element. Given its potential, the cultural route is an important “tool” for the management and development of cultural heritage. Currently, a constant development concerning the cultural routes is observed in an international level during the last decades, as it is widely accepted that cultural tourism has an important role in the world touristic industry.

Regarding the study of cultural routes in Greece as a multidimensional concept the following concerns have arisen: Firstly, we are concerned about the general impact of cultural routes at local and national level and specifically in the economic sector. Moreover, we deal with the concerns regarding the natural environment and we delve into the educational aspect of cultural routes in Greece. In addition, the audience we aim at is both specific and broad and we put forward the institutional framework of the study. Finally, we conduct the development and planning of new cultural routes, having in mind the museums as both the starting and ending point of a route.

5 MINOR SITES AND EXPERIENCE: THE NEW FRONTIER OF ARCHAEOLOGICAL TOURISM

Author(s): Megale, Carolina (Past in Progress)

Presentation Format: Oral

Alleviating the pressure on the major tourist hotspots of a city or a region is one of the major challenges of cultural tourism today. In meeting this challenge at a global level, archaeology plays a key role. Like other humanistic professions, archaeology supports an appreciation of both immaterial and material forms of cultural heritage. It plays a vital part in the cycle of production that, originating with archaeological field practice, leads to finished cultural products. The archaeologist is thus a sort of artisan, dedicated to the production of a good that with a defined use-value and a social purpose. The cycle of archaeological production of cultural goods, in which the archaeologist is the craftsperson, involves several important phases: research, documentation, interpretation, and conservation. Each of these steps seeks to direct the benefit of archaeological “products” toward the public through the provision of services that make a positive contribution to societies and individuals

The role of the archaeologist, faber of these cultural goods and products, is thus completely oriented toward the public and the community of citizens that will benefit from cultural heritage resources. In the modern context, in which tourists are “temporary citizens,” the creation of spaces for experiential tourism is the new frontier. Such public spaces would be strongly anchored in the identity and story of places, offering enlightened, concrete alternatives to mass cultural tourism.

In this vein, a pilot experience has been initiated in the region of Populonia, in the Val di Cornia. Here, an important project of recovery of “minor sites” emphasizes an agenda of education and outreach through the creation of opportunities for experiential tourism. This project orchestrates authentic and unique experiences that both fulfill the desires of tourists, volunteers, and visitors from abroad, and also support a public which is educated, oriented, and aware.

6 MASS TOURISM REACTIONS IN HERITAGE MANAGEMENT: SOME SOLUTIONS FROM NAPLES (SOUTHERN ITALY)

Author(s): De Vivo, Caterina (Made in Culture; CSI Gaiola onlus - Progetto Museo)

Presentation Format: Oral

In the last few years the city of Naples, whose city center is listed as UNESCO heritage site is living a very important increasing of

tourist presences. The increasing of tourists presences is effecting not just the city of Naples, but also its surroundings, where there are relevant and very fragile heritage sites such as Herculaneum and Pompeii. The arrival of so many tourists is obviously effecting the heritage sites and the museums of the city and still solutions are needed in order to find a balance between heritage preservation and accessibility to the sites. The situation is effected also by recent changes in the Italian heritage management system which is leading to a considerable increasing of visitors in the major sites. The change is happening very quickly and the need for solutions is urgent. In this contribution two case studies will be discussed as positive examples to manage the effect of mass tourism in heritage sites. The two examples will be the entrances management policies applied in the Underwater Archaeological Park of Gaiola in Naples, and the project AAA Accogliere Ad Arte Napoli which involves the main cultural institutions of the city to boost sustainable tourism policies.

366 HISTORY AND PREHISTORY OF SPACE: THE ARCHAEOLOGICAL VIEWPOINT

Theme: Archaeological theory and methods beyond paradigms

Organisers: Bouissac, Paul (University of Toronto) - Gheorghiu, Dragos (National University of Arts - Bucharest)

Format: Regular session

With our contemporary knowledge of space including not only high precision maps of both the planet Earth and the solar system, and the ability of exactly locating any position and event through GPS, it is difficult to imagine the representation of space that was available to prehistoric populations from hunter-gatherers to sedentary pastoralists and farmers.

An understanding of the ways in which these populations variously experienced their surrounding space and the expanse beyond their horizon must take into consideration the cognitive (pre-scientific) limitations that necessarily constrained the perception and interpretation of their environment (e.g., the human inability to visually evaluate correctly the relative distances between objects beyond the threshold of the sense of perspective. The heuristic imagination and simulation of the life conditions resulting from such limited cognitive affordances could help understand, using a top-down approach, the functions and meaning of some of the graphic representations these populations produced. Conversely, following a bottom-up approach, this session will also investigate the possibility of inferring from the archaeological record the spatial knowledge that grounded their actions (such as explorations and/or migrations) and artefacts (such as possible geographical and celestial graphic representations) in view of the limitations and opportunities of their life experience of space. Analogical models like experimental and experiential archaeology could be used as additional inference instruments. Comparison with surviving traditional cultures can also help understanding these problematics but cannot suffice to conclusively determine long-past states of affairs.

Therefore this session will address the methodological issues of how reliable can such inferences be in view of the archaeological evidence we have and how these results may converge with the hypothetical (heuristic) reconstruction of a pre-scientific perception and interpretation of space, while being mindful of the danger of being trapped in a circular argument.

ABSTRACTS

1 INTRODUCTION TO SESSION #366

Author(s): Bouissac, Paul (University of Toronto)

Presentation Format: Oral

No data by itself can be correctly interpreted in the absence of Information about its context. Most often this information is of a spatial nature. All too often, we tend to assume that the perception of space is a human universal and we extrapolate our own modern experience of space to reconstruct the spatial context of the archaeological record we attempt to interpret. However, the way space is perceived and conceived is for a large part culture-dependent and, consequently, can be considered to have a history and a prehistory. For example, modern migrants rely on geo-political maps. Early migrants were bound to have a markedly different spatial experience that was not mediated by such artefacts but had to rely on other cognitive affordances such as memorizing beacons and narratives. Can we infer, imagine, or simulate the prehistoric representation of space, and, thus, better understand the spatial context of the archaeological record in view of this tentative reconstructions?

2 TOWARD A REPRESENTATION OF EARLY HUMANS' EXPERIENCE OF SPACE

Author(s): Bouissac, Paul (University of Toronto)

Presentation Format: Oral

Although archaeologists commonly describe distances and relations with respect to the Euclidean frame of reference (e.g., GIS), early hominins and humans were bound to experience spatial reality in a markedly different manner. This paper attempts to tentatively reconstruct, imagine, or simulate, through inferences and comparisons, the ways in which prehistoric populations perceived and conceived their multimodal environment and the constant transformations it underwent. Their mobility was necessarily constrained by their evolutionary endowment both physical and cognitive. Paying attention to the properties of the places these human groups selected as places of predilection and taking into account the limits of the perceptual and cognitive competencies they had evolved in view of their artifactual achievements, it is possible to figure out in a hypothetical but methodic manner the range of affects and thoughts they experienced with respect to their life world once they became bipedal. However,

rather than being merely defined by material constraints and the relentless quest for food and water, the archaeological record can yield indirect but reliable information about the significance and symbolic values they attributed to the dynamic landscapes, both terrestrial and sidereal, they inhabited and through which they survived in constant interaction with other species and natural phenomena that were woven into their narratives, paintings, and cosmologies.

This approach builds upon seminal publications such as Zubrow (2005), Paliou et al (2014), and Waller (2015), among others, to define the problem and adduce some elements towards a tentative reconstruction of early human experience of space, keeping in mind that the diversity of locations and circumstances across vast areas and over very long periods of time precludes any broad generalizations.

3 SPATIAL UNCERTAINTY IN PREHISTORY

Author(s): Zubrow, Ezra (University at Buffalo; University of Toronto)

Presentation Format: Oral

Prehistoric societies had to cope with large amounts of both temporal and spatial uncertainty. Uncertainty for this paper is defined as the difference between the phenomena and its cultural representation.

Spatial uncertainty is the lack of, or the error in, knowledge about an object's geographic position. The sources of spatial uncertainty are errors in geographic location, partial and incomplete knowledge, inappropriate assumptions regarding the environment, problems in classification, and lack of pattern recognition.

How Spatial Uncertainty is communicated is related to how spatial information is classified, stored, and transmitted over time and over space. The importance of waypoints, visualizations, hot spots, and unknown spaces are critical.

This paper attempts to create a general theory of spatial uncertainty and applies it to a variety of Hunter and Gatherer, Pastoral, and Early Agricultural Societies. Whether particular environments, subsistence patterns, or types of sedentism affect spatial uncertainty is considered. The general belief that across time that spatial uncertainty necessarily diminishes is questioned.

4 VISIONS OF THE WORLD AS INFERRED FROM MAPS

Author(s): Vianello, Andrea (University of South Florida)

Presentation Format: Oral

Maps since their inception have used symbols to cognize aspects of the surrounding or perceived space. For the earliest periods, archaeologists are sometimes unsure if some documents are actually maps, demonstrating how spatial representation depends on symbolic systems. Because of their symbolic nature, maps can reveal the perception of space as much geographic information. Even contemporary satellite-based maps are often augmented by symbols (e.g. for roads, cities, etc.) and in the choice of colors, definition, and represented region betray a vision of the people that are using them. Today there is the space at the borders of maps, in historical times mythological creatures represented the unknown, and earlier still maps ended at precise boundaries defining the territory.

It is well known that during prehistoric times, exotica and long-distance exchanges challenged the spatial understanding of the surrounding world, since the territories usually mapped failed much shorter of the actual range of interaction. Today we have the opposite problem, with maps far exceeding our own spatial perception. Thus, maps often betray a certain vision of the world, be it the space 'owned' by a culturally similar group, or the space understood or imagined by people (few will have been in space to date, for example).

Archaeology in particular can provide a balanced view of the actual range of interactions and help understanding how exceptional or indirect some interactions were. By combining information from maps and the material record of the same period and context, I shall attempt to reconstruct the visions of the world that underpinned those selected cultures, between the real, imaginary and the unknown.

5 A PRE-POTTERY NEOLITHIC REPRESENTATION OF SPACE AT GÖBEKLI TEPE

Author(s): Gheorghiu, Dragos (Doctoral School National University of Arts - Bucharest)

Presentation Format: Oral

Space is an abstract concept, difficult to represent and difficult to identify in the visual productions of prehistoric populations. Despite these limitations, iconography sometimes allows the inference of spatial knowledge from graphic representations, when one can identify a coherent network of meanings linking different images. One such example is the iconography of the PPN architecture from Gobekli Tepe, in particular that of Enclosure D. The structural architectural elements were decorated either with complex scenes featuring various species of animals, or only with solitary animals whose position and relationships could offer information on the perception of the PPN environment. A toposemiatic decoding of the zoomorphic decoration of the pillars can act as a cognitive instrument of interpretation of the spatial conception of the hunter-gatherers, where each animal is ascribed to a specific ecosystem, correspondingly to a determined geographic and temporal space. In this interpretation the enclosures of Gobekli-Tepe can be perceived as geographical and temporal spaces representing different moments of the year.

6 UNDERSTANDING NEOLITHIC SETTLEMENTS IN THEIR ENTIRETY: PERIPHERAL SPACES IN NEOLITHIC NORTHERN GREECE, THOUGH CENTRAL TO PREHISTORIC EVERYDAY LIFE

Author(s): Kaltsogianni, Styliani (Aristotle University of Thessaloniki)

Presentation Format: Oral

The methodology that is applied in general in the study of prehistoric spaces aims mainly at our estimation of the interaction among people, social actions and the landscape, evaluating at first the existing archaeological record through the available literature but principally through the systematic excavations and the systematic surveys, in a thorough pursuit of the entirety of the traces of the human activities. We are, therefore, able to connect the results and ideas of various disciplines dealing with neolithic cultural landscapes, modes of production and socioecological systems, as well as to expand our current knowledge and understanding of space applicable to Neolithic communities of Northern Greece (Macedonia, Thrace, Epirus and Thessaly) in a diachronic perspective. A review of the current research on this area results in a thorough reappraisal and a creative reinterpretation of the life experience of space in the light of the complex entanglement of people and things towards more regional and local perspectives, in order to gain a deeper understanding and to facilitate multifaceted insights into areas that for a very long time were only peripheral to archaeological research, but despite their marginal location were central to prehistoric everyday life. In order to negotiate and in an attempt to incorporate all these mixed data, we have to deconstruct the available archaeological material through a procedure of intense critique and recompose it on the basis of meaningful units of the social activities taking place in the landscape, so that we finally derive the meaning from each element separately, appreciate the archaeological information in reference with what it actually represented and classify the sites according to the represented human activities.

7 A HILLFORT WITH A VIEW - DIFFERENT ASPECTS OF VISIBILITY IN STUDIES ON WESTERN POMERANIAN HILLFORTS OF 1TH MILLENNIUM BC

Author(s): Slusarska, Katarzyna (University of Gdańsk)

Presentation Format: Oral

1st millennium BC is the time of emergence fortified settlement structures in the Western Pomerania. Though most of them are only partially recognized or not excavated at all they still drew the attention of scholars. The most discussed is whether they are really defensive structures emerging in response to unstable "political" circumstances or they are some kind of power declaration. Regardless of the "political" role of fortified settlements, they are usually placed in specific landscape and some landforms are preferred. Lower Oder fortified settlements fulfil the definition of hillfort - they are usually built on the tops or upper part of slopes of moraine hills or dunes.

Using environmental and geographical data I'm going to test whether "being visible" or "broad view" could be the most important factor to establish fortified structure.

Regardless of the "political" role of fortified settlements, they are usually placed in specific landscape and some landforms are preferred. Lower Oder fortified settlements fulfil the definition of hillfort - they are usually built on the tops or upper part of slopes of moraine hills or dunes.

Using environmental and geographical data I'm going to test whether "being visible" or "broad view" could be the most important factor to establish fortified structure. The test sites are Garz/Kaminke on Usedom Island, Lubin on Wolin Island and Szczecin-Pomeranian Dukes' Castle.

8 HIDE AND SEEK: PAST LANDSCAPES AND EDWARD HALL'S WORK IN PROXEMICS

Author(s): Dods, Roberta Robin (University of British Columbia)

Presentation Format: Oral

Edward Hall began his anthropological work in the southwest of the USA in the 1930s. He came to see contrasting concepts and manifestations of the use of space through his interactions with both the Navaho and the Pueblo peoples. With the U.S. Army in World War II in the Philippines and Europe and from his earlier diverse observations Hall "began to believe that basic differences in the way that members of different cultures perceived reality were responsible for miscommunications of the most fundamental kind" (Brown 2006). Subsequently Hall became the Director of the Foreign Service Institute in Arlington, Virginia. To this position he brought his cultural perceptions of space and its cultural definitions as important to how we live as individuals and as members of a society and came to train the American diplomatic core in what has been considered its most productive post-war period. He worked his cross-cultural anthropological learnings on human use of space into the macro-analysis of cultural landscapes and the micro-analysis of the dynamics of everyday interpersonal life. His book *The Hidden Dimension* (1966) effectively defined for us public, social (consultative), and intimate (our "bubble") spaces and the material objects there included that defined interactions. He recognized that place/space is the actualization of human thought transformed into cultural landscapes. Therefore, the shape and form of place/space in a specific syntax announces a whole cultural territory of meaning. Ancient territory in which we have not been privileged to participate can be seen as a visual language. They leave us their storyboard of life and with the help of Hall we can come to understand their story.

A POST-HISTORICAL QUERY ON DWELLING —THE HUMAN LIFE-FORM BETWEEN DARKNESS AND LIGHT

Author(s): Barth, Theodor (Oslo National Academy of the Arts)

Presentation Format: Oral

If we take interest in the production and reception of space—as real and imagined expanse—it would seem that what we broadly understand as maps would be located at their interstice: i.e. in between the production and reception of space. According to the Talmud, human vision of the heavens was blocked by a sheath of light in day-time, which was removed at night as heavens opened. In modernity, the satellite-view of the earth a recent tendency has been a darkening of the earth, as the result of human populations crowding to big cities. These Metropoli have in turn become permanently sheathed by city-lights. While the heavens have become crowded with satellites linked to the production of digital space, the reception of the nocturnal space has become increasingly obstructed by city lights. In a historical stretch of time, the productive and receptive aspects of space has arguably completed a full round (i.e. a revolution). The forms of dwelling (Heidegger) at the two ends of this time stretch: humanity caved by darkness, and a different humanity caved by light. A task-force made up of a scenographer, a philosopher, a lawyer, a biologist and MA-student has been working with these questions, flanked by an anthropologist. The paper discusses their process and findings: our archaeological query here delves into what Massumi (2015) has called 'bare activity'—the human life-form understood in terms of its mode-of-dwelling (cf, Agamben's *maneries*); as a premise for building and thought, as aspects of production and reception—i.e., a symbolic compound primed by graphic re-presentations.

STAIRWAYS TO HEAVEN? MOUNTAINOUS LANDSCAPES AS SPIRITUAL AND RITUAL TOPOGRAPHIES

Theme: Archaeology of mountainous landscapes

Organisers: Reitmaier, Thomas (Archaeological Service of the Canton of Grisons) - Callanan, Martin (Department of Historical Studies, Norwegian University of Science and Technology, Trondheim) - Ceruti, Constanza (Institute of High Mountain Research, Catholic University of Salta)

Format: Regular session

Beside their economic, sociopolitical and cultural importance, Europe's mountainous landscapes have always played and partly still play a central role in spiritual or religious activities and beliefs. Marginal, liminal landscapes or prominent peaks as "stairways to heaven" seem to have always fascinated and inspired people to imagine "supernatural" forces living and acting at these higher altitudes. And indeed, there are many examples of "sacred" alpine summits, glaciers and rocks, caves, lakes or mires where gods, ancestors or spirits lived and interacted with humans during the last millennia. Although the possibilities of archaeology are still limited to discover this invisible power or agency, recent discoveries of material remains already allow a more differentiated idea of ritual activities and the symbolic role of mountains. Therefore, this session aims to explore the nature of sacred or ritual topographies in mountainous and upland landscapes to develop a bigger and more coherent picture of different rituals, their archaeological indicators and the common characteristics of high-altitude "sacred" places. For this, it also seems essential to integrate these transitional topographies into other forms of daily life and economy (e.g. settlements, pastures, hunting grounds, exploitation of different raw materials, mobility and trade routes), and to critically explore how the perception of sacred landscapes was entangled with ancient communities. We would like to invite colleagues from all fields of archaeology, history, ethnology, biology, anthropology and other relevant fields to discuss various manifestations and methodological reflections on ritual activities in high altitude locations in a European or even global perspective, from hunter-gatherer societies through pastoral landscapes to the sacralization of mountains during the Modern Age.

ABSTRACTS

RELIGIOUS ROMANTICISM: OBSTACLE TO AN UNDERSTANDING OF PREHISTORIC SACRED TOPOGRAPHIES?

Author(s): Mathieu, Jon (University of Lucerne)

Presentation Format: Oral

In traditional Christian belief systems the natural world did not play a significant role. As a result of its particular history, this Western religion had an inwards-looking character and emphasized the community of the believers. The worship of natural objects was not only undesirable, but explicitly forbidden. In Latin America, for example, the Spanish staged a massive campaign for the 'extermination of idolatry' (*extirpación de la idolatría*) in the 17th century. The campaign aimed at widespread indigenous cults which celebrated mountains and other features of landscape together with people's ancestors. The cults were considered pagan, if not diabolical, by the colonial rulers, and had to be crushed.

Since the 18th centuries, however, Christianity changed. Not least under the influence of organized science, religious interest in the natural world, increased considerably. In several waves, going from physico-theology through to deep ecology in the 20th century, Western belief developed new environmental attitudes which may be summarized here as 'religious Romanticism'. In the Alps this can be shown, for instance, with the mounting of Christian crosses on mountain summits, a habit started around 1800. The movement affected the interpretation of historical roots, as well. While in earlier days the transition from pagandom to

Christiandom had been seen as a cut, interpreters now saw continuities, particularly in relation with natural cults. Thus the Church was sometimes characterized as a staunch successor of Celtic and other rites. At the same time, officially refuted 'witches', 'fairies', and 'spirits' gained new prominence as (presumed) expression of true popular credence.

In my paper I would like to take up some of these issues in order to stimulate the interdisciplinary discussion about prehistoric 'stairways to heaven'. My examples are mainly taken from the Andes and the Alps since the 17th century.

2 DEATH OF THE ICEMAN: REFLECTIONS ON SACRED LANDSCAPE AND RITUAL PRACTICE IN THE NEOLITHIC ALPS

Author(s): Reinhard, Johan (Retired)

Presentation Format: Oral

In recent years landscape archaeology has become an important theoretical approach to apply in studying archaeological sites throughout the world. However, the sacred role that landscape could have played has been difficult to evaluate in ancient societies lacking historic documentation. This is still more the case the further back one goes in time. The Neolithic is especially problematic due to the lesser certainty as to what constituted sacred objects and the beliefs that would have been associated with them. In this paper, I will examine the role that the Alpine landscape could have played in our understanding one of the most famous discoveries from the late Neolithic: the 5,300-year-old Iceman found in the Tyrolean Alps. Widely interpreted as his having been killed by chance on a high pass, several elements relating to the location he was found, the circumstances of his death, the kinds and distribution of the artifacts recovered with him, and the condition of his body still remain difficult to explain. An explanation utilizing an approach including sacred landscape and the ritual treatment of the Iceman's body is presented here that appears more consistent with the known facts and suggests avenues of research that will assist in furthering our understanding of Neolithic religion in the Alps.

3 FIRE, WATER, MOUNTAIN – SACRIFICIAL SITES AT ALPINE LAKES

Author(s): Waldhart, Elisabeth - Stadler, Harald (Institut für Archäologien, Universität Innsbruck)

Presentation Format: Oral

Two recently discovered sacrificial sites on lakeshores in Eastern Tyrol lead to a closer examination of this special type of feature above timberline. The "Brandopferplatz" at the Alkuser See at 2.440 m above sea level is located on a flat hilltop at the south shore of the lake. Ceramic fragments in the charcoal strata date to the late Bronze Age, early Iron Age and Roman Period. Calcinated bones suggest bloody sacrifices. A range of fibulas and shoe nails indicate an attendance during the late Iron Age and Roman Imperial Period. Stray finds from the Anraser See on 2.540 m, mainly consisting of bowl and jug fragments of the Laugen-Melaun type, can be compared with the ceramic ensemble of the Alkuser See.

Mountain lakes are not only prominent topographic features, but also numinous sites. Despite their remoteness they are closely linked to high Alpine economic spaces. Both sites lie on the upper limits of recent mountain-pastures. In the area below the Alkuser See as well as at comparable topographic situations in the region there is also evidence for ranching in the later Iron Age. The Alkuser See is embedded in an archaeological rich landscape, allowing linkage from the Brandopferplatz to other sites nearby.

With charcoal layers as traces of bonfires, the sacrificial sites join fire of burnt offerings with the water from the mountain lakes in a "sacred" topography. Through giving an overview of known sacrificial sites on Alpine lakes, this work aims to induce a discussion about the connection between the ritual of burning offerings, the water of the lake, the location between summits and various economic activities throughout prehistory.

4 WITHIN REACH OF SUPERNAL NUMEN? HIGH-ALPINE BRONZE AGE MINERAL SPRING AND RIVER OFFERINGS

Author(s): Oberhänsli, Monika (Archäologischer Dienst Graubünden)

Presentation Format: Oral

Within the last 170 years, a large number and variety of high-altitude finds and features have been discovered in the Alps that can be linked to Bronze Age landscapes. In most cases a lack of a significant archaeological context for intentional deposits of sacrificial or votive offerings of archaeological artefacts, make them methodologically hard to reconstruct and characterise in detail. A few exceptional features nevertheless leave no doubt that they can be seen in such a sacrificial context. Within the Alpine area, the Middle Bronze Age capture of a mineral spring at St. Moritz in the Upper Engadin Valley (Canton Graubünden, Switzerland) may well be the most extraordinary and best-known example of such a site. Its large and multi-part construction was built of larch wood during the summer of 1410 BC and due to waterlogged conditions is exceptionally well preserved. The centre of the structure is formed by two enormous hollowed-out tree trunks, used to capture the highly carbonated spring water, which were associated with several high prestige, partly non-local votive gifts. Originally unearthed during construction work in 1907, this Bronze Age spring capture site at St. Moritz has been re-examined for the first time in terms of a detailed functionality reconstruction, dendrochronology, wood-working and sacred contextualisation. Only recently, the oldest sacred object known so far from the Engadine Valley, an Early Bronze Age axe of Langquaid II type, was discovered in the River Inn at Ftan. Like St. Moritz, the Lower Engadine Valley is known for its highly mineral-rich springs. This contribution aims to embed these newly examined sites within the context of topography, mobility and sacrificial practices within the Alps and beyond.

5 MOUNT PERDIDO: SACRED AND SYMBOLIC DIMENSIONS OF A HIGH LIMESTONE MASSIF IN THE PYRENEES

Author(s): Ceruti, Maria Constanza (UCASAL / CONICET)

Presentation Format: Oral

Mount Perdido (3355 m) is part of the Pyrenean massif of the Three Sisters and it is considered to be one of the highest limestone mountains in Europe. It overlooks the Ordesa valley, a nineteenth century destination for British hunters of wild mountain goats. The area is visited nowadays by hikers and mountaineers, in search for the aesthetic experience of walking and climbing in one of the most beautiful corners of the Pyrenees. The sacred and symbolic dimensions of mount Perdido are timidly revealed in the Tibetan prayer flags and personal items deposited on its summit. The fascination exerted by this numinous peak is balanced against its terrifying nature, as described in the Pyrenean folklore and in oral narratives that keep alive the memory of lethal accidents on the dangerous slopes below the summit. Symbols of the Catholic religion, which crown the heights of neighboring peaks, are not present on mount Perdido. The presence or absence of certain religious items at the foot, on the slopes and on the summits of culturally modified peaks can be analyzed from an archaeological perspective, as material evidences which reveal the sacred dimension of mountainous landscapes.

6 THE LONELY MOUNTAIN – WROCZEŃ (SANOK DISTRICT, SE POLAND) – A SACRED MOUNTAIN OF THE IRON AGE COMMUNITIES.

Author(s): Bulas, Jan - Okońska, Magdalena (Jagiellonian University) - Kotowicz, Piotr (Sanok)

Presentation Format: Oral

In the vicinity of the Wroczeń mountain, in the last decades, many prehistoric settlements have been discovered. Most of them date to the Roman period. However, the settlements associated with the La Tène period and the early Iron Age are known as well. Some of these sites, located at the foot of the Wroczeń mountain, were excavated and provided numerous archaeological materials. The area of the Wroczeń itself until 2015, was not penetrated to a significant extent by archaeologists, due to the forest cover of the mountain.

Over the last four years, due to accidental discoveries and conducted archaeological excavations, the image of this place has changed significantly. Discoveries of deposits of iron tools as well as other objects, like bracelets, give evidence to the sacred significance of this place in the La Tène period. There are also finds, from the Wroczeń as well as from the other mountains in the Sanok region, that would suggest a special role of the mountains also for the bronze age societies. Between 2015 and 2018 excavations, which led to the exploration of the whole site, have been conducted on the necropolis of the Przeworsk culture, dated to the Roman period. During the research on this small burial ground located on the slopes of Wroczeń, ten graves were discovered of which half were, richly furnished with weaponry, burials of warriors.

The discoveries of recent years allow a new interpretation of the Wroczeń mountain as a place that occupied a prominent place within the sacrum of the iron age community. The presentation aims to present the results of field-work carried out in recent years on the mountain and the possibilities of interpreting the Wroczeń mountain as a place of religious significance in the context of other finds from the Sanok region.

7 HER GHOST IN THE FOG... SILENSI AND THE OTHER SACRED LANDSCAPES IN THE SLAVIC BELIEFS IN SUDETY MOUNTAINS

Author(s): Lisowska, Ewa (Uniwersytet Wrocławski)

Presentation Format: Oral

Early medieval tribal beliefs mainly focused around deities and phenomena related to nature. Among them, we find sacred mountains, springs, stones, groves, trees. Located on the Sudeten Foreland, Mount Ślęza – Silensi, since the prehistoric times was surrounded by worship. On cloudy days its peak is shrouded in fog, during the storms most atmospheric discharges are concentrated around the top of this mountain. These phenomena perhaps have already been noticed in the Lusatian culture, and then in the Latene period and Early Middle Ages. Pagan religious practices in Ślęza we can find in historical sources as well as archaeological finds. In addition to the cultivated practices on Ślęza that have also survived in folk tales, we know a dozen or so points in the Sudetenland, which are considered to be medieval places of worship (stones, springs). Among the practices of symbolic significance, one can also mention finds of foundation offerings or, most probably, deposits of ferrous objects. All these sources create an image of the relationship between human spirituality and the surrounding mountains. The research was carried out as part of the project of the National Program for the Development of Humanities (No. 2aH 15 0283 83).

8 SACRIFICIAL MARSHES IN THE AGDER REGION

Author(s): Sayej, Ghattas - Wintervoll, Joakim - Fredriksen, Rune (Vest-Agder County Council)

Presentation Format: Oral

In the coastal heaths of Agder, there are a number of sacrificial sites in conjunction with topographically defined marshlands. The finds and sites are scattered across a belt in the heaths 7-10 km inland from the Agder coast, and situated at a height of 160-180 meters above sea level. The locations are neither coastal, typical inland nor high mountain locations. Comparing the data gathered from finds, the sacrificial objects so far found appear to have a chronological center in the Neolithic and Bronze Age, between 3800 and 500 BC.

The sacrificial marshes are topographically quite similar, and often in the form of concave recesses in the landscape. The recesses are shielded from the outside by elevations in the landscape, usually in all directions. Centrally located on the sacrificial sites are marshes, or small bodies of water enclosed by marshes. The places are perceived as closed, hidden and shielded from the outside world. Common to the majority of the locations are single deposited objects on the edge of the marsh. In some locations, there are also grave mounds at a higher elevation overlooking the marsh; these are so far without the discovery of sacrificial objects.

The objects found are usually not a result of archaeological investigations, but found due to landowners work with the cultivation of the areas or drainage of marshland. Much of the data gathered does thus come from randomly submitted findings. It was not until 2018 that the Vest-Agder county council had the opportunity to investigate one of these sacrificial sites. In this presentation, we will focus on the results from the archaeological investigations of Gullmyra ("Gold marsh") at Hageland in the municipality of Mandal.

9 THE CASE OF THE SOUTHERN SAMI GIEVRIE- RESCUING OR DENUDING RITUAL MOUNTAIN LANDSCAPES?

Author(s): Callanan, Martin (NTNU Norwegian University of Science and Technology; Dept of Historical Studies)

Presentation Format: Oral

In the Southern Sami areas of Scandinavia, decorated frame drums (gievrie) were used for different ritual and quotidian practices through millenia.

They were however viewed as pagan objects by many Christians and were confiscated by the church during different phases of periodic missionary zeal. Many of the drums' owners, preferred to hide them on secluded mountain sites rather than handing them in to the authorities.

A number of Southern Sami frame drums have been recovered from remote mountain sites in recent years and have subsequently been conserved and taken into museum collections. But is this knee-jerk policy appropriate or indeed the best way to safeguard these unique objects and sites?

In this presentation, we will explore and discuss different perspectives on the current, policy of collecting remains of Southern Sami Gjevrie from their mountain hiding places and placing them in museum collections. Are we not denuding these ritual mountain sites through our current rescue practices?

10 SACRED HILLTOP SITES IN THE PO VALLEY DURING THE IRON AGE BETWEEN ECONOMIC CHANGES AND CULTURAL POROSITY

Author(s): Fogliazza, Silvia (Université Paris Nanterre; Sapienza Università di Roma)

Presentation Format: Oral

As a result of the Etruscan expansion that from the mid-6th century B.C. also involved the westernmost area of the Po Valley, the Etruscans, favoured by the use of writing, held economic and political control over a culturally heterogeneous territory, characterized by Ligurian and Celtic presences. Before the Celtic invasion at the beginning of the IV century B.C., the ancient sources mention the presence of Ligurian people in the high areas of the Apennines and Celtic people in the high plains and hills.

It is precisely from the Apennine hills that traces of different cult places come.

What kinds of rituals are displayed on these hilltop sites? Which is the connection between these sacred places and the important communication routes and trade roads that cross the Po Valley during the Iron Age? What changes follow the Celtic invasion?

The aim of this paper is to analyse the ritual behaviours on the hilltop sites and their connection with the political, economic and religious dynamics of the Po Valley during the Iron Age, considering the cultural porosity that characterises this border territory.

11 SETTLEMENT PATTERNS AND SACRED AGENCIES FROM A DIACHRONIC PERSPECTIVE: THE ROLE OF SACRED PLACES IN THE PELIGNA VALLEY

Author(s): Moderato, Marco (DISPUTER, University G. D'Annunzio of Chieti) - Casolino, Chiara (DISPUTER, University G. D'Annunzio of Chieti; Scuola di Specializzazione in Beni Archeologici "Dinu Adamesteanu", Università del Salento)

Presentation Format: Oral

Sacred places played different roles which can be understood only through a global diachronic landscape approach; pre-roman and Roman sanctuaries may still function during late antiquity and early middle ages, they can change place while maintaining their function or they can disappear leaving their sacred perception unchanged. The spatial and chronological framework must be related to the features of the ancient communities that inhabited those landscapes. The use of sacred places such as high grounds, springs, woods, and peaks is marked by the continuity or re-use of sacred places despite a sometimes unfavorable settlement substrate. What are the agencies of sacred topographies during a specific chronological phase? What are the features that affect the continuity/discontinuity of those places? What are their relationships with human and natural geographies? Finally, How all these components work with each other in the construction of historical landscapes?

This paper aims at answering these questions by analyzing the sacred topography from pre-roman to early medieval times in the Peligna Valley (Abruzzo, Central Italy), a mountain and high ground landscape characterized by river valleys and steep reliefs and

inhabited from the Bronze Age to nowadays.

12 MONTES IN LATIN LITERARY EVIDENCES

Author(s): Curca, Roxana-Gabriela (Alexandru Ioan Cuza University of Iasi)

Presentation Format: Oral

The mountains (montes) have been the subject of important contributions in the exegesis and provided a comprehensive overview on this particular aspect. This subject is far too large to be treated in its completeness, therefore a selection of most representative texts will be emphasised and discussed. The exegesis in this area corroborated the literary sources with the archaeological realities and the philological analysis. This contribution aims to explore the different types of perception of the authors regarding the mountains as reflected in Latin sources. Our research, based on the works of historians, geographers or poets, aims to provide a classification of these perceptions. The mountains are described either only from geographical point of view, either underlying their symbolic features. The Latin literary records will draw attention to different aspects, such as military and strategic role, sacred ceremonies performed on the mountain, impact of the mountain into human behaviour, the mountain wilderness, etc.

13 THE MOUNTAINS OF CRETE: RITUAL AND REPRESENTATION OF SPIRITUAL GEOGRAPHY IN THE MINOAN BRONZE AGE

Author(s): Peatfield, Alan (University College Dublin)

Presentation Format: Oral

The mountains of Crete are the geographical background to the cultures of Crete in all periods. They are present not just in physical form, but also in ritual and representational form. For Bronze Age Minoan Crete, the mountains are spiritually manifested as the peak sanctuaries, which are the dominant cult places of Minoan civilisation. There are around 30 of these mountain peaks, who share features of topography and material finds deposited through rituals of offering, primarily clay figurines (animals, humans, and votive limbs). In this presentation we propose to draw together the threads of the material culture of the peak sanctuaries, and to demonstrate how they impact into the religious life of Minoan culture. We show how sacred geography expresses concepts of ancestry (linking the living and the dead), community fellowship (sharing processes of creating and offering votives), leadership (representation of mountains in elite art and symbolism), and the journeys of spiritual experience.

14 MOUNT ANETO AND THE "CURSED MOUNTAINS" IN THE RELIGIOSITY AND FOLKLORE OF THE PYRENEES

Author(s): Ceruti, Maria Constanza (UCASAL / CONICET)

Presentation Format: Oral

Mount Aneto rises 3404 meters above sea level and it is the highest mountain in the Pyrenees. It crowns a large massif of diverse granite peaks and glacier lagoons, known as "the cursed mountains" (Montes Malditos). The ascent of Aneto is considered an alpine climb, due to the prominence of the peak, the altitude of the summit, the extension of the glacier to be traversed and the frightful crossing of an eerie rocky crest known as "Mahoma's pass". A circular structure about 3 meters wide has been built on the summit of Aneto, which houses a distinctive cross, an image of Virgin Mary "del Pilar" and a small statue of Saint Anthony, in addition to numerous Tibetan prayer flags and personal objects transported by the climbers. In this communication I intend to explore the religious and spiritual dimensions of mount Aneto, which oftentimes go unnoticed, in view of the importance of the peak as a destination for sportive climbing and mountaineering. The sacredness attributed to this emblematic mountain is revealed in the materiality of the objects deposited on the summit (and the tensions that they reflect and create), as well as in the Pyrenean folklore which copes with the more threatening aspects of the "cursed mountains" by means of cautionary tales and moralizing religious images.

15 THE SACRIFICIAL LANDSCAPE OF THE AIT ATTA NOMADS BETWEEN THE JEBEL SARHRO REGION AND THE CENTRAL HIGH ATLAS (MOROCCO)

Author(s): Reitmaier, Thomas (Archaeological Service of the Canton of Grisons; University of Zurich, Institute for Archaeology) - Sichert, Benjamin (Integrative Prähistorische und Naturwissenschaftliche Archäologie, University of Basel)

Presentation Format: Oral

Since 2017, a new ethnoarchaeological project has been documenting one of the last families from the Ait Atta tribe, alternating between a winter camp in the Jbel Sarhro region near the desert and rich summer pastures to the north in the central High Atlas. The area used by these nomads between the two mountain ranges not only forms a "natural" basis for a pastoral lifestyle, but also contains different elements of a "sacred" or ritual landscape. The nomads' everyday lives include fulfilling their Muslim duty of saying their prayers five times a day at specific times facing in the direction of Mecca. The ritual landscape also includes burial places (e.g. Islamic cemeteries) where the dead are laid to rest. Important clues which may point to even earlier practices can be found in the vicinity of the summer camp and especially on the "holy" mountain, Jbel Azourki (3700 m a.s.l.). The mountain has numerous natural caves, one of which is located to the east of the summit and remains full of snow and ice, even in the summer months. Once a year, the nomads still hold a sacrificial feast near this cave, ritually slaughtering various domestic animals. Finally, numerous rock-art sites dating back several centuries are located at the foot of the mountain. They can perhaps be seen

as visible evidence of earlier agreements between the Ait Atta and local settled tribes to regulate agricultural and pastoral use (Agdal system). The nomads spend the winter months in the mountains of the Jbel Sarhro region some 350 kilometres south-east of Marrakech. This desert-like region boasts another holy mountain, Jbel Amlal, which also shapes the pastoral, sacrificial landscape of the Ait Atta nomads.

16 GEOMANTIC ENTANGLEMENTS WITH MOUNTAINS IN CENTRAL TIBET: ROYAL TOMBS OF THE CHONGYE VALLEY

Author(s): Romain, William (Independent researcher)

Presentation Format: Oral

Situated in central Tibet, the Royal Tombs of Chongye Valley are the final resting place for many of the imperial emperors of the Tibetan Empire to include Songtsen Gampo (AD 605–AD 649), the first emperor of Tibet. Among the Royal Tombs of the Chongye valley is a group of ten known as the Mura group. Emperor Gampo's burial mound is found in this group. Analysis of Google Earth imagery shows that Emperor Gampo's burial mound (130 m x 124 m x 18 m), as well as eight others belonging to the royal lineage located in the Mura group are geomantically aligned to special mountains. The targeted mountains are associated with important deities and legends. Among the special mountains are Mount Gonpo - the locale for the Monkey God and Rock Ogress creation myth that accounts for the origin of the Tibetan people; and Mount Shelbrag, where the first legendary king of Tibet descended from Heaven. Also targeted was Mount Shampo - the manifestation of a mountain deity said to be a protector of the royal lineage. It is proposed that the geomantic connections to these and other legendary mountain places affirmed the divine lineage of the emperors and provided spiritual protection for the deceased.

17 HIGH MOUNTAIN ARCHAEOLOGY: THE NEPAL TEMPLE PROJECT – ARCHAEOLOGY OF A HINDU TEMPLE

Author(s): Lange, Perry (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

The Nepal Temple Project is an international and interdisciplinary campaign which combines, cultural historical research, archaeology and restoration in Nepal.

Our central area of activity is the Anantaliṅgeśvara Mahādeva Temple in Nepal. The Temple is located about 20 km southwest of Bhaktapur in the valley of Kathmandu (UTM 45, WGS 84: R 343140/E 3058601). The site is placed on an artificially constructed plateau close the south-eastern slope of a hill at an altitude of 1450 m, below the peak of the mountain and close to the historical connecting route of the old royal cities Kathmandu and Bhaktapur.

The ensemble, founded between the 5th to the 7th century CE, is one of the earliest cult sites of Lord Śiva in Nepal. In this 3200 sqm large area 17 buildings of different periods and functions are assembled. The Anantaliṅgeśvara Mahādeva Temple is an integral part of a sacral landscape, consisting of 64 śivaliṅga, which encircle the nepali national shrine, the Paśupatināt Temple in Deopatan, in three concentric rings.

Genesis, continuity and changes of the temple complex through time are the research questions of the project. In this case we want to point out an exceptional special feature of the Hindu iconography and architecture - the concept of the sacred landscape and there relationship between cult, culture and the peoples living in this high mountain area.

18 UPLAND SOCIETIES AND FOREST COMMUNITIES OF INDIA BEFORE COLONIALISM: BURIAL PRACTICES, GRAVE GOODS AND IDENTITY IN THE NILGIRI HILLS

Author(s): De Simone, Daniela (The British Museum)

Presentation Format: Oral

The Nilgiri Hills, a massif of 2500 km² that form part of the Western Ghats mountain range, are located at the intersection of the modern states of Tamil Nadu, Karnataka and Kerala in South India. It is a region of montane tropical forests with peaks over 2500 m, and is the homeland of 15 plus indigenous groups, the 'hill tribes' of colonial ethnography.

The hilltops of the Nilgiris are dotted with ancient graves, which are marked by stone circles and earthen mounds. Excavations at burial sites were started by British officers in the 1840s. Elaborated pottery urns containing incinerated bones were unearthed along with other grave goods, such as gold ornaments, bronze bowls, and iron weapons. By convention —albeit inaccurate— these assemblages are described as 'prehistoric' and dated to the 'South Indian Iron Age' (c. 1200-300 BCE).

Forest-dwellers are mentioned often in texts and inscriptions, and represented in the figurative arts produced by the dynastic powers of the Indian plains. Since these people seem to have created neither written records nor monumental art, the knowledge of their history is limited and biased.

Archaeological research in Indian forests remains at an early and undeveloped stage. This is partly due to practical difficulties in carrying out research in such areas, but the paucity of research is also a by-product of the colonial misperception of forest-dwelling communities as primitive and isolated.

This paper will look at how forest-dwellers created and negotiated their identities and belief systems in relation to their environment by presenting the preliminary results of a recent survey of the area around Udthagamandalam in the Nilgiri Hills, and of the study of Nilgiri burial practices and grave goods.

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HIDDEN STAIRWAYS AT THE FOOT OF THE HIMALAYA – RESULTS OF GEOPHYSICAL SURVEYS AND EXCAVATIONS IN THE PHOBJIKHA VALLEY, BHUTAN

Author(s): Ullrich, Burkart (Eastern Atlas) - Bader, Christian (Swiss-Liechtenstein Foundation for Archaeological Research Abroad SLSA, Zurich) - Della Casa, Philippe (Department of Prehistoric Archaeology, Institute of Archaeology, University of Zurich) - Fux, Peter (Museum Rietberg Zurich) - Hart, Benjamin - Keiser, Alexander (Department of Prehistoric Archaeology, Institute of Archaeology, University of Zurich) - Tenzin, Karma (Section of Archaeology, Division for Conservation of Heritage Sites - DCHS, Department of Culture, Ministry of Home and Cultural Affairs, Royal Government of Bhutan)

Presentation Format: Oral

This paper presents preliminary results of recent geophysical and archaeological investigations in the Sacred Phobjikha Valley in central Bhutan, one of the key research areas of the Bhutan-Swiss Archaeology Project initiated by the Royal Government of Bhutan, the Swiss-Liechtenstein Foundation for Archaeological Research Abroad and the University of Zurich.

Initial research recorded approximately 50 artificial standalone and grouped mounds at the edges of the glacial valley. Most of the mounds are a few meters high but sky-rising hills are also known from aerial pictures. The recent damaging of one of the largest mounds near the Ngelung Drechagling Lhakhang monastery highlights the need for further knowledge to protect the endangered cultural heritage. So far, little is known about their function, chronology, and construction.

In 2018, high resolution geophysical surveys using ground penetrating radar (GPR) and electrical resistivity tomography (ERT) were executed at six selected mounds of varying shape, dimensions, and preservation state. The work was conducted in close cooperation between specialists and cultural officers from the Department of Culture of the Bhutan Ministry of Home and Cultural Affairs, who were trained in the application of nondestructive survey methods as part of the educational program of the project.

Here we present the preliminary results of the investigated mounds. The 3D-geophysical data give detailed insights in their construction up to 3 m below the surface. In horizontal slices and cross-sections of some of the surveyed mounds an X-shaped structure in the center can be seen, surrounded by rectangular step-like foundations. Recent excavation at one of the directly endangered mounds confirm the inner structure and the stairways alike, and reveal further details about the remaining part of the mound.

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CERRO LLAMOCA: IMPORTANT LANDMARK OF A SACRED LANDSCAPE IN THE ANDES OF SOUTHERN PERU

Author(s): Reindel, Markus (German Archaeological Institute) - Isla, Johny (Peruvian Ministry of Culture)

Presentation Format: Oral

As part of the research project „Andean Transect“, the German Archaeological Institute studied a large number of pre-hispanic sites in the most diverse ecological zones between the Pacific Ocean and the western cordillera of the Andes in southern Peru. Evidence of religious practices related to water and fertility are manifest in many places that can be considered as part of a holy landscape. One of the most emblematic sites with these characteristics is a mountain called Cerro Llamoca, located at an altitude of 4500 masl, right above the headwaters of the Viscas River, a tributary of the Río Grande de Nasca River. Because of its proximity to the river springs and an extended peat bog that attracted human settlers since the earliest occupation of the region (around 10000 BC), the mountain was venerated as Apu (holy mountain) throughout pre-hispanic times. Around and on the summit of the mountain a great number of Apachetas (stone piles) and structures can be observed, including a D-shaped structure, an architectural form that is clearly linked to religious practices of the Wari culture (600-1000 AD). In colonial documents, Cerro Llamoca is mentioned as one of the most important sacred mountains of the Central Andes. The written sources also describe the associated idols that were destroyed by the Spaniards during the so-called extirpation of idolatry in the early colonial period.

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EAA-SAA SPONSORED SESSION: FOSTERING TRANSATLANTIC LINKS TO STRENGTHEN THE PROFESSION AND RELEVANCE OF ARCHAEOLOGY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Criado-Boado, Felipe (EAA President) - Watkins, Joe (SAA President)

Format: Discussion session

SAA and EAA cooperate regularly in different activities to promote the benefit of their members and of the archaeological community as a whole. For several years they have been creating joint spaces of interaction and dialogue. Now they have decided to go a step further in this collaboration, organizing “sponsored sessions” in the annual conferences of both organizations labelled by the two associations jointly.

This session is the first of what we hope will be a long and fruitful trajectory of future joint sessions. To open this series, the first session will be organized and chaired by the two current presidents together. The theme that we propose to our members this time is using the EAA + SAA platform to solve the great challenges that our profession faces and contribute to the solution of the great problems that Humankind confronts nowadays. We invite our members to submit proposals for contributions on how to take advantage of the SAA-EAA capacities to strengthen mutual collaborations and propose joint actions. We especially look forward to receive proposals that cover all the thematic variety that our associations cover: research, heritage, management, professionalism, policies, stewardship, working and life conditions of Archaeologists, the public, citizenship, and so forth. Future

sponsored sessions will be organized by other members in collaboration with the presidents.

The European Association of Archaeologists (EAA) and the Society for American Archaeology (SAA) are membership-based international associations dedicated to research, interpretation, and the protection of archaeological heritage. Both associations promote the development of collaborative and interdisciplinary research, the management and interpretation of archaeological heritage, the advancement of archaeological practices and profession, and the exchange of archaeological information, debate and dialog. They together represent an important sample of the world archaeological community, with a combined total of over 10,000 members from around the world.

ABSTRACTS

1 RESEARCH, HERITAGE PROTECTION AND NATIVE AMERICAN INVOLVEMENT - POLISH ARCHAEOLOGICAL INVESTIGATIONS IN THE HEART OF THE MESA VERDE REGION, COLORADO

Author(s): Palonka, Radoslaw (Institute of Archaeology, Jagiellonian University; Crow Canyon Archaeological Center)

Presentation Format: Oral

The Sand Canyon-Castle Rock Community Archaeological Project has been conducted since 2011 in the central Mesa Verde region in the southwestern part of Colorado in the North American Southwest. The project focuses on the study of the settlement structure and socio-cultural changes that took place in Ancient Pueblo culture during the thirteenth century A.D., also known as the Late Pueblo III period. The project research also includes documentation of rock art panels and murals from different periods and their connection to the settlement structure and landscape features (mesas, mountain ranges). Rock art depictions include mostly single geometric motifs, individual figures of people and animals, shamans, and extended scenes that include fighting and also the hunting of large animals, mostly deer and bison. Also, on almost every panel of rock art modern graffiti or vandalism such as initials and names is also present.

This project is being conducted by the Institute of Archaeology, Jagiellonian University in Krakow, Poland in cooperation with two American institutions: Crow Canyon Archaeological Center and the Canyons of the Ancients National Monument (a branch of the Bureau of Land Management), Colorado. A significant part of the project is also conducted in cooperation with Hopi representatives from Arizona, one of the direct descendant groups of Ancient Pueblo peoples.

2 A TRANSATLANTIC PROFESSION

Author(s): Hinton, Peter (Chartered Institute for Archaeologists)

Presentation Format: Oral

This paper reports on a particular type of transatlantic alliance, between two professional associations managing the largest registers of professional archaeologists in Europe and the Americas.

The Register of Professional Archaeologists (RPA) is based in the United States. It is a listing of archaeologists who have agreed to abide by an explicit Code of Conduct and Standards of Research Performance. RPAs agree to being held accountable for their professional behaviour through a formal grievance procedure. The establishment and acceptance of universal standards in archaeology is the fundamental goal of the Register. To achieve this goal, the Register and its sponsoring and affiliated organizations are working to encourage registration. They are also working to obtain the endorsement of the Register by other national, regional, and local organizations, as well as by organizations that serve a review, referral, or granting function.

The Chartered Institute for Archaeologists (CIfA) is the leading professional association representing archaeologists working in Europe and further afield. CIfA promotes high professional standards and strong ethics in archaeological practice, to maximise the benefits that archaeologists bring to society. Accredited CIfA professionals have demonstrated technical and ethical competence in archaeology by means of an examined portfolio of work in whichever areas of archaeology they work. They have agreed to comply with the CIfA Code of conduct and CIfA Standards and guidance: the Code and Standards identify outcomes and processes expected of many types of archaeological work. CIfA professionals act impartially, and are accountable under professional conduct procedures. CIfA also maintains a register of organisations, similarly accountable.

In 2017 the two organisations entered a Memorandum of Understanding, and are collaborating on the provision of ethical resources for archaeologists, the development of archaeological skills and other initiatives. This paper will present some of that work.

369 RHYTHMS IN MATERIAL CULTURE

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Paladino, Vincent (American Anthropological Association) - Gheorghiu, Dragos (National University of Arts in Bucharest)

Format: Regular session

This session shall examine the relationship between material culture and rhythms, from visual art to music in an attempt to define and express common components. Rhythm in painting is expressed as pattern distribution. In sculpture, rhythm is locked temporally, fusing the expression of a moment with timelessness, bringing forth a new expression from movement and being.

Musical instruments convey the rhythmic movement of the breath or the hands through their shape, illustrating that existence as we know it is meaningless without rhythmic cycles which power life and beingness. The rhythms of place, of architecture and urban planning, shall be considered here; objects divided by space are experienced as related through rhythm, and temporality as a sense is quantified as movement, beats and rests. The manner and methods through which rhythm is integrated with objects of creation is here explored. We invite archaeologists, anthropologists and artists to contribute to this debate.

ABSTRACTS

1 INTRODUCTION TO SESSION #369: RHYTHM IN MATERIAL CULTURE

Author(s): Paladino, Vincent (Rutgers University; American Anthropological Association)

Presentation Format: Oral

Material culture arises from the deep rhythms of cyclic nature, manifesting through the bodies of plants and animals. Human bodies generate objects that are crafted by human movement, whether voluntary or autonomic. The rhythmic pulses of our lives are driven by the periodic undulations of our entire solar system. Rhythm in and from our bodies is a manifestation of a crucially important aspect of our reality: polarities give rise to rhythms. Exchanging positions through attracting and repulsing we manifest it in ourselves, with limbs that extend through the pulling of their bones. All the goods crafted by hand bear the marks of their maker's motions. The body's planes are crossed by limbs and digits, leaving material altered to the shape of their movement, in angles and waves. This session addresses the expression of rhythms in the objects and structured spaces crafted by human hands and minds: Rhythm in Material Culture.e4

2 RHYTHMS OF PLACE AND DWELLING: THE TELLS OF THE SOUTH-EASTERN EUROPE

Author(s): Gheorghiu, Dragos (Doctoral School National University of Arts - Bucharest)

Presentation Format: Oral

The Chalcolithic tell-settlements of the Balkan-Danube-Carpathian Chalcolithic traditions are an example of rhythmic activity of construction and deconstruction that creates artificial forms of relief, due to the many overlapped levels of inhabitation.

A tell settlement could be described as follow: a rhythmic mode of dwelling on a limited surface, surrounded by a palisade and ditch, characterized by cyclical processes of construction and deconstruction.

Viewed from the perspective of symbolic behaviour, the tell-settlement appears as the result of a complex functional and symbolic activity, and of alternating stages of dwelling and abandonment.

An examination of the tells' stratigraphy represents not only the analysis of the rhythms of dwelling and abandonment, but of the rhythms of culture and wilderness of a place, revealed to us as overlapped layers of house debris, separated by layers of soil, or of sediments from disastrous floods.

A special case in the rhythmicity of the dwelling in a tell is the recycling of old material as a symbolic technology of rejuvenation of the old substance of the settlement.

The paper will present the rhythms of living and abandonment in two tell-settlements from the Lower Danube area.

3 RHYTHMS IN MATERIAL CULTURE

Author(s): Paladino, Vincent (Rutgers University; American Anthropological Association)

Presentation Format: Oral

This session shall examine the relationship between material culture and rhythms, from visual art to music in an attempt to define and express common components. Rhythm in painting is expressed as pattern distribution. In sculpture, rhythm is locked temporally, fusing the expression of a moment with timelessness, bringing forth a new expression from movement and being. Musical instruments convey the rhythmic movement of the breath or the hands through their shape, illustrating that existence as we know it is meaningless without rhythmic cycles which power life and beingness. The rhythms of place, of architecture and urban planning, shall be considered here; objects divided by space are experienced as related through rhythm, and temporality as a sense is quantified as movement, beats and rests. The manner and methods through which rhythm is integrated with objects of creation is here explored. We invite archaeologists, anthropologists and artists to contribute to this debate.

4 TRACING GRAVITY - CREATING SPACE THROUGH ENCOUNTERS WITH SANDSTONE BOULDERS AND STONE AGE ENGRAVINGS IN FONTAINEBLEAU

Author(s): Samuelson, Geir (University of Bergen)

Presentation Format: Oral

This presentation will reflect upon one specific encounter with Mesolithic engravings in the region of Fontainebleau, France, from the viewpoint of rhythm in works of art and rhythm in bodily movement. The encounter took place after several years of traveling and climbing in the same area and involves an artistic view on archaeology and contemporary archaeological research. The presentation will reflect upon skill and involvement in climbing, rhythmical gestures in the execution of painting, rhythms and visual vibrations in the final work of art, time and synchronicity. The presentation will focus on the mystery and beauty of the area

and on this specific meeting, and the artistic pretext of the encounter. It will also sketch out some possible artistic strategies in the continuation of the research into these specific engravings, and into archaeological research in general from the viewpoint of art. The presentation will discuss art and archaeology in an expanded field. It will contain pictures.

Geir Harald Samuelsen is an artist; painter and photographer, and Associate Professor, Artistic Research Leader at The Art Academy, Department of Contemporary Art, University of Bergen, Norway.

5 RHYTHM IN THE GREAT DIONYSIAC FRESCO IN VILLA OF THE MYSTERIES, POMPEII

Author(s): Lindstrom, Torill Christine (University of Bergen)

Presentation Format: Oral

The Great Dionysiac Fresco in Villa of the Mysteries near Pompeii is one of the largest, best preserved, and most studied paintings from Roman antiquity. The Fresco has been interpreted from various perspectives, but still has many questions connected to it.

One question is: How should it be “read”? As a contingent cycle from left to right, or from right to left? As two parallel, separate friezes? In a criss-cross manner? Or, as consisting of ten separate scenes with little, if any, connection between them? – The question about the Fresco’s “reading” is important because it has implications for the question whether the Fresco is a copy, or an original composition; and can have implications for the Fresco’s overall interpretation.

Wesenberg (1997) made the observation that, in each scene, there is one person who detaches himself/herself from the group of other persons that he/she is spatially, thematically, or activity-wise co-located with.

I took this observation further, and found that: The detached persons move away from, or look away from, or beyond, their surroundings, and always in the same direction: towards the right. I discovered that all the persons (and one animal) in the Fresco create a distinct rhythm, a 4/4-rhythm. The person on the “fourth stroke” (with one exception) leads the spectators’ gaze towards the next scene. This rhythm is repeated in all the Fresco’s scenes, apart from scene VI which shows the divine couple. However, this is the central scene and pivotal point of the Fresco, and differs in several aspects. – I conclude: This 4/4-rhythm creates coherence and unity in the Fresco’s spatial structure. It supports a left-to-right “reading”; and provides a strong argument for the Fresco’s compositional originality. The rhythm may also allude to Dionysianism, where music, singing, and dancing were important cultic components.

6 THE FORCE TO OWN TIME. A STUDY OF TORE VAGN LID’S ‘THE PRINCE —MACHIAVELLI VARIATIONS’

Author(s): Barth, Theodor (Oslo National Academy of the Arts)

Presentation Format: Oral

In the work of stage-director—and dramaturge—Tore Vagn Lid, the rhythmic structure of his work is literal. It is literal at different levels of superposed practices. At one level, the structure of his plays is rooted in the rhythm, often inspired by reggae. At another level, the stage repertoire is regularly developed from musical studies, or études. These studies are of three different kinds: micro-études, macro-études and reflective études. As a stage-director Vagn Lid rarely sticks to the text-materials he develops as a dramaturge. Rather he develops score that allow non-same locations to join onstage: each of his plays thereby constitute a single, but complex site. The broader interest of his work lies in how the music—conceived as an «object»—constitutes a method to explore the relationship between superimposed locations (online, onstage and video) in a sense of story that does not follow a linear plot. His approach is post-historical in the sense that the actants in his plays often are located in different places and times, yet are conjoined in a single site as contemporaries (Agamben)). He intervenes directly into time and politics as the ‘force to own time’ (Massumi). All his plays are political, in a literal sense: a) in terms of his choice of themes and topics; b) in the sense that the politics takes place spatially onstage (most of them spaces built to include the public into the play). Most of his plays are such that the audience can easily deconstruct the information into its constituent parts, featuring in his 1) research-materials, and 2) the formal constraints he works with, in counterpoint. The communication within the play—between its actants—beyond the play, as conveyed by the audience, is preempted, but is also fundamentally unpredictable.

7 RHYTHMS OF TIME (ON THE EXAMPLE OF STOVE TILES OF THE NEW JERUSALEM MONASTERY OF XVII-XVIII CENTURIES)

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

Presentation Format: Oral

Each historical period has its own style in architecture, music and art. These laws also apply to small architectural forms, in our case to tiled stoves.

The Nikon period (the time when the construction was run by Patriarch Nikon himself – 1654-1666) is characterized by the most complex compositions of carpet tiles, where the full pattern consists of 17-18 separate figures arranged in a certain order and distributed in 2-3 rows. Each turn of the pattern ends with a new flower or flowerpot at the same time similar to the previous and completely different of it.

Peter’s time (the reign of Peter I) is characterized by the individualization of a single tile. At the same time, the creation of these separate plot pictures of the whole structure required the inclusion of additional elements that do not carry any constructive task, in addition to connecting diverse subjects into a single whole, the creation of a common rhythm of the composition. In some

cases, the difference in the color solution of the same tiles played a unifying rhythmic function.

As we can see, different principles of rhythmic integration of individual parts into the whole stove corresponded to different historical epochs.

8 RHYTHM IN FORM AND DECOR OF MEDIEVAL WOODEN AND BONE ARTEFACTS FROM OLD RUS'

Author(s): Zhilina, Natalia (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The aim is to observe the role of rhythm in the form and decor upon carved items. In the form of rationally built thing (for example, a chair), interrelation between its parts is characterized by the rhythm reflecting the construction (constructive rhythm). Surface decoration is distributed between the ornamental zones on the main parts of the object (ornamental compositions of chair backs). Sculpture images continue the regularity of constructive rhythm by the volume accentuation of important parts (bone spikes). It emphasizes the form of the object. New ornamental rhythm of surface compositions may not or not fully correspond to the constructive rhythm. Sometimes it visually destroys the form of the item.

Depictions of any object with rational natural rhythm are included in ornament: plant, animal, man. Ornamental rhythm changes or breaks the natural one. In anthropomorphic, zoomorphic and floral ornaments, the parts of figures are made corresponding one to another. An element with defined magnitude and form becomes the rhythmic unit (square, triangle; straight or curved section). An ornamental element is analogous to the unit of duration in music. From the elements the motif is built, the magnitude of every part is aliquot to the element. Compositions are built on the surface of the object or in the space occupied by it, like rhythms (melodies) in music unfolding over time.

According to the correspondence between rhythm and form, carved items can be divided into groups: 1) keeping the natural rhythm in general; 2) breaking it by emphasizing some parts of the image (idols); 3) giving elementary stylization with simple rhythmic unit; 4) made in artistic styles with difficult ornamental rhythm characterized by curvilinearity and asymmetry (Scandinavian styles); creating a clear regular rhythm (Byzantine ornament).

These groups show the forming of Russian ornamental styles in the 10th – 11th centuries.

9 TEMPOS OF TIME: THE RHYTHMS OF CHANGE AND THE CONSTRUCTION OF 'REALITY'

Author(s): Dods, Roberta Robin (University of British Columbia)

Presentation Format: Oral

Edward Hall's naming of time (a taxonomy, a typology, a classification, a categorization...?), as experienced by humans, becomes a starting point of a short history on some archaeologically cogent concepts of change through time. The concept of change through time (evolution) can be seen in biological and cultural analyses of the 19th Century. We recall this in the ordering of tool technology with Thomsen's Three Age System and subsequently with Morgan's Unilinear Theory of Cultural Evolution, which in some sense 'fits' with the earlier 'Age' system. It was, however, Petrie in the late 19th century that turned us to the beginning of a micro-analysis with his seriation of the ceramics in an Egyptian cemetery. In a sense this was almost a poetic, surreal contemplation of the material world although it took additional subsequent data to give us its true usefulness. Indeed, seriation allowed the jump to the archaeological application of the Doppler effect – our adventure in a significant area of physics that speaks to a deeper contemplation of time/space in a material world. This then is our entrée into new and expanding understandings of time via quantum mechanics. Emerging paradigms of how time 'operates' challenge us to consider what would have been seen as fantastical in the past. From this we can vision our lives through time as a tangle/untangle of cosmic poetic metre.

10 RHYTHMS IN MATERIAL CULTURE: THE CASE OF THE PARTHENON

Author(s): Pateraki, Kleanthi (Independent Researcher)

Presentation Format: Oral

The aim of the oral presentation is to examine the Parthenon as a typical example of a building, in which the existence of an inner rhythm is ascertained, that is harmony, balance and charm.

Attention will be focused on the architecture of the temple. The intentions of the architects will be highlighted, as well as the elements which indicate the harmony and overall architectural integrity of the monument. Moreover, the mathematical (e.g. the entasis of the columns) and the architectural optical deceptions (i.e. the unique optical refinements of the Doric order) will be presented, through which the inequalities and deviations were set off and the technical problems were solved. Furthermore, the innovations found in the building will be mentioned, which enrich its impression. In addition, particular importance will be given to calculated proportionings of parts and rhythmic correspondences (for instance at the areas of the entablature), which, according to some studies, match the so-called "golden ratio".

The result of all the above is unprecedented technical perfection. The Parthenon becomes a "living" temple, a vibrant organic ensemble, a balanced and harmonious whole characterized by amazing unity of form, monumental majesty and unique grace.

Author(s): Colorado, Apela - Bramley, Timoti (www.wisn.org)

Presentation Format: Oral

Increasingly western scientific disciplines and indigenous ways of knowing, or Indigenous Science, are brought together. Indigenous Science refers to the place based, holistic and spiritual knowledge system and wisdom traditions of indigenous peoples (Colorado 2014; Colorado & Hurd 2018). Here, Indigenous Science perspectives are presented in a reciprocal relationship of contextualization with applied archaeology, visual arts, and sound performance. Contemporary Polynesian myths and images, based on lores of the Maori People of Aotearoa, New Zealand, are explored as we consider the emergent creation spiral, the realms of Te Po—the nights of creation and birth of consciousness, vibration and mystery (Henare 2001, Jones 2013). The rhythms encoded in creation stories have been handed down as a sequence of transmissions that instruct many aspects of material culture in Indigenous life. For Maori, this is found in whakairo (carvings) of the whare-tupuna, the ancestral carved house, and waka, sea-faring canoes. Also, in raranga (weaving), we find patterns on whariki, ceremonial mats, the ket, baskets to hold knowledge, and the korowai, cloaks worn to express, preserve and keep warm. Besides their functional influence on material culture and life ways, we honor these indigenous accounts of creation as rhythmic liturgies of the living, breathing universe, illuminating the intangible architecture of all creation as well as our sacred and contemporary role within it.

PRESIDENT 'S THING 2019: 25 YEARS AFTER

Theme: Global change and archaeology

Organisers: Criado-Boado, Felipe - Waugh, Karen (European Association of Archaeologists)

Format: Round table

As part of an EAA 25th anniversary-driven review, I have decided with the agreement of the Executive Board, to establish a new tradition in the EAA: an annual special session - organized by the president. This will develop as an annual assembly and forum for the discussion of timely issues, relevant to the EAA and relevant to Archaeology and its social relevance. Relying on previous experiences in Vilnius 2016, where we gathered to discuss the potential issues that might follow the Brexit referendum, and in Barcelona 2018, where we debated issues on international cooperation and archaeology, I am now proposing that this should become an annual event. Its function will be to gather and hear members' voices, opinion and analysis. The theme I propose for this year is the developing role of archaeology in our challenging times.

The 25th anniversary is a special occasion for EAA and a point in time for us to consider how Archaeology can reflect on, deconstruct and analyse the great tangle of human cultural evolution and its dynamics, and the essence of what we are as societies. The EAA Bern motto, Beyond Paradigms, reminds us that, if paradigms become barriers (like mountains), they can limit our vision, enclose our lives and experiences and our ability to think creatively.

Thinking beyond the developed theoretical constraints of our discipline, will enable us to discover the fissures in these paradigms that, like the passes through the Swiss mountains, can be routes for communication, interaction, exchange and convergence. EAA Barcelona's motto, Reflecting Futures, reminded us that Archaeology is as much about the future as it is about the past because archaeologists superpower is to understand and articulate how the future comes into being. Archaeology has the capacity to reflect on the societal and cultural forces that create our futures and therefore has some ability to think about how these processes will shape the future.

The session will start with some short presentations by EAA members from different backgrounds, fields of activity and personal/professional circumstances. This will be followed by an open discussion drawing from the contributions and welcoming essential reflection and opinion from the floor.

TRIAL AND ERROR IN TIMES OF TRANSITION

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Dzhhanfezova, Tanya (Oxford University) - Zidarov, Petar (New Bulgarian University)

Format: Regular session

This session aims to stimulate a discussion on the theoretical and methodological premises for the identification of experimental phases in the technical/technological and social developments of prehistoric and early historic communities.

All societies eventually faced the challenge to adapt to changing social or ecological conditions. The wellbeing and the progress of the pre-industrial population were based mainly on the equilibrium between the stable traditional solutions and the collective decision to modify them or not. However, the typical museum exhibits usually portray the successfully adopted innovations that turned into mainstream practices.

But how many times have we missed the early signs of inventions during their experimental phase? Could we identify the initial stages of technological novelties? Are we aware of the variability of the possible factors and the intensity of the eventual reactions? Is there any synchronism between the experimental stages of coeval productions based on various raw-materials (clay, flint, bone, etc.) or the actual dynamics point towards far more complex and independent developments? How can we identify the minor adjustments, the gradual progress and the abrupt technological changes that took place within global processes pertaining to major shifts like the Neolithisation or the rise of Urbanism and the complex social hierarchies?

As 'History is written by the victors', quite often it is the 'best' examples of the technological achievements that are to be examined or displayed. However, archaeology is tasked with documenting reality and is not similarly constrained. This session welcomes papers concerned with the experimental phases in the development of any technologies as well as with the inventions that remained stillborn well ahead of their time, with special attention to processes that took part in the Neolithic, the Chalcolithic and Bronze Ages across the Old World.

ABSTRACTS

1 NEOLITHIC FLINT ASSEMBLAGES FROM BULGARIA: THE CHALLENGE OF CAPTURING A TRANSITION

Author(s): Gurova, Maria (National Institute of Archaeology with Museum, Bulgarian Academy of Sciences)

Presentation Format: Oral

The chipped stone assemblages from Bulgaria during the Neolithic period (6th millennium BC) reflect the changes and gradual transition in the Neolithic lifestyle, comprising both – technology and social organisation. Raw material procurement strategy is one of the most important aspects of the decision-making of prehistoric communities in face of the challenges/constraints of the environment.

The distribution and use of particular stone raw materials in distinct 'cultural' contexts suggest different values embodied in various raw materials. Thus, the later became a hallmark for community lifestyle and in a broader scale – for intercommunity = territorial/local and supra-regional relations. A typical example is the Early Neolithic chipped-stone assemblages of the Karanovo I and II cultural alliance (part of a supra-regional technocomplex in the Balkans) which is recognisable by formal toolkits made of Balkan flint.

The use of Balkan flint (with several reliably identified outcrops, but without any certain workshop documented!) represents one of the most distinctive characteristics of these assemblages. During the first half of the 6th millennium BC, the Balkan flint distribution system was one of two major lithic exchange networks operating in Southeast Europe (together with that of Melian obsidian from the Aegean). From 5500 BC a significant shift in raw material (particularly Balkan flint) procurement and network distribution took place. After its fundamentally important role in the Neolithization process and its wide distribution in the Early Neolithic of Southeast Europe, Balkan flint use and significance declined (most probably during the Karanovo III or III-IV period) and there appeared chipped stone industries based mainly on local resources and expedient production.

Based on sound empirical data, the paper provides a cognitive insight into Balkan flint, which has been an emblematic raw material in the Early Neolithic Balkans.

2 EXPERIMENTAL COMPLEXITIES IN YAYOI POTTERY PRODUCTION: SOCIAL LEARNING AND TECHNOLOGICAL CHOICE IN MICRO-REGIONAL TRANSITIONAL GROUPS

Author(s): Loftus, James (Kyushu University)

Presentation Format: Oral

Situated between the 14,000 year long hunter-gatherer societies of the Jomon period and the fully-fledged wet-rice agricultural society of the middle Yayoi period; the early Yayoi period in Kyushu Island, Japan saw several significant upheavals in societal structures, subsistence practices, and the creation of multi-leveled material cultures attributed to large waves of migration from the Korean peninsula into the Japanese archipelago. Looking at the clean-cut pottery typo-chronologies of contemporary literature on this important transitional period may lead one to believe that the indigenous material culture, especially pottery, was completely uprooted and replaced by the technologically superior migrant culture. The smooth transition of pottery shape types also prompts images of standardized pottery production at the local and region-wide level. However, this project, through the use of combined multivariate statistical pottery analysis and detailed idiosyncratic analysis shows that this initial period of interaction between the indigenous Jomon and the incoming migrants was instead characterized by multiple intervals of experimentation in pottery production methods and vastly different social learning environments derived from divergences in technological choices. Within the small Northern-Kyushu micro-region, pottery producing groups show differing ranges of specialization of pottery production as well as the incorporation of potters of various skill levels. Thus, this author contends that previous studies that understand this period of material culture change as cultural dominance by the incoming migrants have completely ignored the complex nature of information transmission and the important role of technological choices and experimentation in the pottery production process.

3 THE EARLIEST NEOLITHIC POTTERY IN THE MIDDLE VOLGA REGION OF EASTERN EUROPE: CONCEPTIONS OF APPEARANCE AND DEVELOPMENT

Author(s): Kulkova, Marianna (Herzen State University; Peter the Great Museum of Anthropology and Ethnography - Kunstkamera) - Andreev, Konstantin - Vybornov, Alexander (Samara State Academy of Social Sciences and Humanities)

Presentation Format: Oral

The appearance of Neolithic traditions among Mesolithic hunter-gatherers can be connected with migration of Neolithic farmers. Environmental factors were probably among the causes: the transition from the Mesolithic to the Neolithic (at c. 8200 calBP) was characterized by complete aridisation in the steppe and forest-steppe zones. The earliest Neolithic sites with 'Elshanian-type'

pottery are located between the steppe and forest steppe zones in the Middle Volga River basin. The closest analogues to the typological and technological characteristics of Elshanian pottery were found on the eastern coast of the Caspian Sea and the Central Asian interfluves at the Uchaschy, Daryasay, and Dzhebel sites. Radiocarbon dates on the earliest Neolithic materials in Central Asia have the same age. Because of the 8200 calBP climatic event the groups which produced the 'Kairshak type' pottery moved from the northern Caspian shore towards the steppe region of the Volga River basin and the northwestern coast of the Caspian. They influenced the development of the Varfolomeevka and Dzhangar traditions in these regions. The characteristics of the pottery, the ornamentation techniques, and motifs support this. The process of neolithisation on the north coast of the Caspian and the Lower Volga regions was embedded in the period c. 8500–7900 calBP. Naturally, in dry periods the forest zone with woodlands and rich food resources was a favourable area for people from more arid southerly regions. The results of thin-section analysis of Elshanian pottery and radiocarbon dating support this conception.

4 **STARTING POINT OR NEXT STOP? EARLY NEOLITHIC POTTERY PRODUCTION IN SOUTHEAST EUROPE**

Author(s): Dzhanfezova, Tanya - Doherty, Chris (University of Oxford)

Presentation Format: Oral

Identifying and understanding the starting points of early technologies is not always straightforward. This is the case for the beginning of pottery production, as there are no accepted criteria for what the expression of a site's first pottery should be.

The characteristics of the earliest known ceramic vessels can be associated with certain prerequisites necessary for the adoption of the new technology. The very same features can yet be a secondary and logical consequence of the start of the ceramic production at specific locations. Similarly, the technological approaches taken by Early Neolithic potters can either be considered as evidence for strict adherence to conservative received pottery traditions; or as a marker of locally developed innovations, dispersed further along the Neolithisation trajectories.

The central question is therefore how to examine the possible experimental phase? This discussion explores the following: should an experimental stage be expected at all? Is there an acceptable body of specific features that outline such period? What are the hallmarks for a phase in which people tested, perhaps failed and improved further their technical skills and approaches? How long would this last? Did previous knowledge influence the start of the new technology or did the pottery 'arrive' along with fixed recipes?

Several Southeast European Early Neolithic sites will be considered as examples for the complexity and the importance of this topic. This will lead towards a re-evaluation of otherwise well-known features of the Early Neolithic pottery production. The extent to which a site creates or simply transfers the rules will contribute to the question about the identification of an experimental phase in early ceramic productions.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 798143.

5 **POTTERY TRADITION IN TRANSITION? THE PASSAGE FROM THE EARLY TO THE MIDDLE NEOLITHIC PERIOD AT ILINDENTSI, SOUTHWEST BULGARIA**

Author(s): Dzhanfezova, Tanya (University of Oxford) - Grębska-Kulowa, Małgorzata (Blagoevgrad Historical Museum)

Presentation Format: Oral

There is gradual continuity between the Early and the Middle Neolithic period at the site of Ilindentsi, Southwest Bulgaria. Dated to the mid 6th millennium BC, this settlement is an excellent example for the delicate modification of some of the earlier technological approaches and styles of local ceramic production. The continuation of such well established Early Neolithic techniques, combined with the initial markers of the newly shaped Middle Neolithic style, allows for the identification of a transitional and possibly experimental phase, or at least a potential series of exploratory technological attempts.

This paper is focused on the seemingly irrational amalgam of elements typical for the two consecutive periods. The novel dark and shiny polished style which became characteristic for the entire region of the Middle Neolithic Balkan peninsula is in sharp contrast with the main decorative approach from the developed phase of the Early Neolithic period. Interestingly, the desired dark surface has sometimes been achieved by adaptation of earlier techniques. There is also cases of irrational application of engobe on otherwise black polished surfaces. Furthermore, often the combinations between the old and the new elements do not meet the expectations for high-quality sharp colour contrast, established in the earlier stages of the painted tradition. These diverging variations of the technological choices and especially the pigmentation effects are in contrast with the otherwise strict stylistic formulae practiced in the Early Neolithic period.

The focus here is on the reasoning behind the incorporation of earlier decorative elements into the newly shaped pottery styles and fashions. The possible causes for the seemingly illogical technological decisions are examined in details by multistrand analysis. The ceramic material from this settlement thus represents excellent example for the trial and error in times of transition.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 798143.

6 WEAR PATTERNS ON LATE CHALCOLITHIC AND EARLY BRONZE AGE BASALT VESSEL BASES IN THE SOUTHERN LEVANT. THEIR CHARACTERISTICS AND MEANINGS

Author(s): Hruby, Karolina - Chasan, Rivka (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa) - Groman-Yaroslavski, Iris (The Use-Wear Analysis Laboratory, Zinman Institute of Archaeology, University of Haifa) - Rosenberg, Danny (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa)

Presentation Format: Oral

The Late Chalcolithic and Early Bronze Age periods in the southern Levant mark immense economic and technological developments. These dynamics in evolving socio-economic environments correlate with an increase in craft specialization and the formation of long-distance exchange networks. This is seen particularly in the distribution of basalt vessels that were traded in large numbers throughout the region.

Late Chalcolithic and Early Bronze Age basalt vessels are characterized by a high-level artisanship and morphological uniformity. Types are dominated by flat based or fenestrated pedestal vessels during the Late Chalcolithic (often decorated) and flat base only during the Early Bronze Age (only rarely decorated). These vessels were likely produced by specialists in workshops located at or in the vicinity of basalt sources, and they were likely regarded as highly valued objects.

During our studies of these vessels in recent years, we noted that these show varying types of intensive wear. One type of wear, which is the center of our presentation, was noted on a few basalt vessels only. This is a shallow usually polished depression that was formed on the interior base near the wall, probably resulting from a rotational action of another item within the bowl. The wear occurs on various types of basalt vessels found at sites located in different parts of modern day Israel. Given the uniqueness of the wear, we suggest that it is related to a specific function, and while our study of this wear pattern is in its infancy, we will present a few examples and discuss possible meanings.

7 WHO MAKES HISTORY IN PREHISTORY? THE SOCIAL MEANING OF ADVANCED TECHNOLOGIES AT VARNA AND TROY

Author(s): Zidarov, Petar (New Bulgarian University)

Presentation Format: Oral

Two famous prehistoric sites – the Chalcolithic Varna necropolis on the Black Sea coast (5th mill. BC) and the Early Bronze Age Troy (3rd mill. BC) situated between the Marmara and the Aegean, have both provided examples of extremely rich and technologically advanced copper-based metallurgy, teneutics and goldsmithing, unparalleled in the quantity and quality of their products and workmanship over vast territories and for hundreds of years. From a socio-economic perspective, the advanced development of these three industries is considered the ultimate correlate for craft specialization and often points to the crossing of a significant threshold in the transformation from primitive craft production to market and/or tributary economy. In the Ancient Near East, this development, in turn, is linked to the emergence of complex hierarchical social structures and urbanism. However, neither the socio-economic development of Varna nor even that of EBA Troy has been discussed in such terms. The parallel development of other technologies - pottery, stone-knapping, lapidary, and bone carving - documented at these and neighbouring sites will be reviewed as a control group to assess the extent of craft specialization and division of labour, as well as its implications for reconstructing the socio-economic structure in these distinct societies.

8 LIFELONG LEARNING. ARCHAEOLOGICAL EVIDENCE OF SUCCESSES AND FAILURES IN COPPER-BASED METALLURGY IN BRONZE AGE POLAND

Author(s): Baron, Justyna (University of Wrocław) - Nowak, Kamil (Institute of Archaeology, University of Wrocław)

Presentation Format: Oral

Macro- and microscopic observations and SEM imaging of metal objects dated to various stages of the Bronze Age show a picture far from ideal model of prehistoric metalworking. It is also completely different from what we used to think about Bronze Age metallurgy shifting softly from beginner (early stages of early Bronze Age) over advanced (late stages of the early Bronze Age) to master level in the late Bronze Age. Same simplified and probably untrue model is often supported by the expected tin content increasing from the early Bronze Age onwards. Analysed metal objects represent however a variety of techniques and recipes depending rather on the expected quality. They show discrepancy with the model assuming simple and linear growth of tin content. Moreover, there is a abundant evidence – even at a single archaeological location – of unsuccessful casting events, lack of control of the temperature and very likely random recipes of copper-based alloys. Interestingly, these are observed not only in early Bronze Age material. Diachronic analysis of the both sampled and complete metal objects showed successes and failures in copper-based metallurgy in the Bronze Age and at the transition of the Bronze and Iron Age as well.

374 BABIES, BATHWATERS, WHEELS, AND CHARIOTS: ASSESSING THE IMPACT OF DAVID ANTHONY'S WORK ON EUROPEAN AND EURASIAN STEPPE PREHISTORY

Theme: Archaeological theory and methods beyond paradigms

Organisers: Johnson, James (University of Wyoming) - Kroonen, Guus (Leiden University)

Format: Regular session

From his seminal work on migration to ideas about the chariot as well as his strong support for the combination of historical lin-

guistics and archaeology to evaluate numerous societal and material developments in European and Eurasian steppe prehistory, David Anthony has been an influential and, often times, a controversial figure in our respective disciplines. This session seeks to bring together numerous and various scholars who will engage critically with Anthony's work; testing, evaluating, and ultimately determining its long-term applicability for illuminating social, political, economic, and linguistics processes and/or practices in prehistory. Thus, we invite papers that critically and creatively engage with Anthony's work, even as these papers should attempt to shed new light on the variable dimensions of life in later prehistory, be it through archaeological, genetic, or linguistic investigations, or combinations of the three. We are especially keen on seeing research that emphasizes cross-pollination between the disciplines that actively engage with the broader themes covered by Anthony, not least of which include migration, technological developments such as the wheel and chariot, production of frontiers, and the link between elite status and ecology.

ABSTRACTS

1 CLEAR SKIES OVER THE INDO-EUROPEAN HOMELAND?

Author(s): Kroonen, Guus (Leiden University; Copenhagen University) - Van Amerongen, Yvonne (Leiden University; Archol)

Presentation Format: Oral

"Any solution to the homeland problem must be able to explain how we can recover cognate terms associated with farming from Ireland to India." Thus James Mallory (2013) identifies one of the darkest clouds over the IE steppe homeland. In view of the lack of "serious evidence for arable agriculture east of the Dnieper until after 2000 BCE", the Steppe Hypothesis indeed fails to explain the fact that the reconstructed Proto-Indo-European lexicon contains not many, but certainly some words related to arable agriculture. Despite the Steppe Hypothesis being favored by most Indo-Europeanists on the basis of additional linguistic and increasingly also palaeogenomic evidence, a mismatch therefore still exists with the archaeological record. To investigate the extent of this mismatch, this paper tests the newest insights on the reconstructed Indo-European vocabulary associated with crop domestication against an updated archaeological record on the agricultural remains from the Pontic-Caspian Steppe before the 2nd millennium BCE.

2 WHEEL AND CHARIOT IN EARLY IE: WHAT EXACTLY CAN WE CONCLUDE FROM THE LINGUISTIC DATA?

Author(s): Kümmel, Martin Joachim (Friedrich-Schiller-Universität Jena)

Presentation Format: Oral

Hardly any part of David Anthony's well-known 2007 book has been more often cited in the context of the spread of Indo-European (IE) languages than the treatment of wheeled vehicles, including a useful map showing the distribution of different common terms across IE subgroups. These linguistic data have regularly been used as an argument that the common ancestor of all IE languages must have been spoken at a time and place where wheeled vehicles already were in use. On the other hand, this reasoning has been criticized from more than one perspective, proposing alternative explanations for the data that do not presuppose the presence of such technology for the reconstructed protolanguage, and thus allowing for an earlier dating. The aim of my contribution is to reassess these linguistic data and what they really can tell us and what they cannot. Three main points will have to be discussed in this respect: 1. What exactly do we have to reconstruct for which protolanguage? Is the picture significantly different for the ancestor of all IE languages (including the Anatolian subgroup that possibly split off before all others) compared to the common ancestor of the rest, or the protolanguages of subfamilies? 2. How secure is the semantic reconstruction of protolanguage items? E.g., how and when can we know that a word reconstructed from attested words meaning 'wheel' actually meant 'wheel' in the protolanguage? 3. Under which circumstances is it possible to explain apparently identical words with the same meaning by spread across language boundaries so that the term cannot be reconstructed for the protolanguage? These questions are not trivial, and there is a danger of oversimplification, especially in interdisciplinary research. However, a refined analysis can still lead to nuanced answers leading to progress.

3 ANIMALS, METAL AND ISOTOPES: CASE STUDY FROM THE LATE BRONZE AGE STEPPE VOLGA REGION

Author(s): Shishlina, Natalia Ivanova (State Historical museum, Moscow) - Roslyakova, Natalya (Samara State University of Social Sciences and Education) - Kolev, Yury (Samara Regional Natural History Museum) - Bachura, Olga (Institute for Ecology of Plants and Animals, Ural Branch of the RAS)

Presentation Format: Oral

Mikhailovka-Ovtsyanka, which is a production settlement of metal workers, was excavated in the south of the Samara Trans-Volga region. The ¹⁴C data obtained suggest that this settlement was in operation throughout the 18th–15th centuries BC. Miners used mines to search and extract copper ore. The occupation layer yielded a lot of ceramics, more than one hundred stone implements and around two hundred bone tools related to production and treatment of copper minerals as well as fragments of ore, slag, crucibles, casting molds and tool fragments. Thousands of bones of domesticated animals are a peculiar trait of this occupation layer. Practically all bones are kitchen refuse. The question is where the cattle were kept, and who grazed the cattle consumed as food at the settlement? The stable isotope study and determination of the season when the animals were slaughtered and the age of the slaughtered animals provide an opportunity to discuss the organization of a specific annual/seasonal production cycle that both the miners and the residents from the settlements located nearby and at a distance from Mikhailov-

ka-Ovsyanka (manual workers and cattle breeders) were, probably, involved in. The study has been performed with support of the RFFI Drevnosti grant 17-29- 04176 and under the State Assignment - project 33.1907.2017/PCH.

4 THE HORSES OF BOTAI – HUNTED OR HERDED? A REAPPRAISAL OF THE EVIDENCE

Author(s): Brownrigg, Gail (Independent scholar)

Presentation Format: Oral

There has been controversy as to whether horses were domesticated and ridden as early as the 4th millennium BCE.

Like the work of Lefebvre des Noëttes, whose proposition that ancient harness strangled the horses and prevented effective equid traction until the “invention” of the horse-collar in the Middle Ages (a mistaken conclusion based on misinterpretation of the evidence, but still widely disseminated today), David Anthony’s well-written and easily accessible theories of early domestication, riding, and chariotry have reached a wide but to a great extent unquestioning audience.

I consider one of the keystones of this hypothesis: the proposal which has become widely (though not universally) accepted, that the horses in the Eneolithic settlement of Botai in Kazakhstan were not only domesticated but used to hunt wild horse herds.

In addition to Anthony’s outline of this theory in *The Horse the Wheel and Language*, I consider the various “evidence” put forward, and I offer counter-arguments to the claims for domestication and riding at that place and time.

I discuss various strands of “evidence”, including: early artefacts interpreted as an indication of domestication, bits, biting and toothwear, corrals and dung, horse control and management, consumption and storage of horse meat, recent DNA findings, the topography of the area, and analysis of lipids on potsherds. I also make comparisons with the earliest indisputable archaeological finds of chariot horses in the Sintashta-Petrovka burials in South Russia, dating to the 3rd millennium BCE.

I hope that my conclusion that there is still insufficient convincing evidence to prove that the horses of Botai were either domesticated or ridden, but that they were more likely to have been rounded up and slaughtered for meat by hunters, will lead to further discussion and research as to when and where horses were first domesticated and exploited.

5 ANIMAL TRACTION IN PROTO-INDO-EUROPEAN

Author(s): Pronk, Tijmen (Leiden University)

Presentation Format: Oral

In his influential 2007 book *The Horse, the Wheel and Language*, David Anthony applied linguistic paleontology to the question where and when the reconstructed Proto-Indo-European language was spoken. He also meticulously studied the domestication of the horse and its role in Indo-European society. In the present lecture, the focus will be on some other elements of the Secondary Products Revolution (Sherratt 1981) and how they are reflected in Proto-Indo-European. In particular, terminology pertaining to animal traction will be discussed and compared to the data in the recent archaeological literature (e.g. Gaastra et al. 2018). Words for ‘yoke’ and ‘shaft, pole’ can be reconstructed for the earliest layers of Proto-Indo-European. Related words for ‘ox’ are also found in several Indo-European languages, suggesting a common origin. The archaeological evidence for the use of draught animals and castration sets temporal and perhaps also spatial limits on Proto-Indo-European. It will be investigated to what extent these limits are in line with the conclusions that Anthony reached in his book.

Anthony, D. W. (2007). *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton University Press.

Gaastra, J., Greenfield, H., & Linden, M. (2018). Gaining traction on cattle exploitation: Zooarchaeological evidence from the Neolithic Western Balkans. *Antiquity*, 92(366), 1462-1477. doi:10.15184/aqy.2018.178.

Sherratt, A. (1981). Plough and pastoralism: aspects of the secondary products revolution. In I. Hodder, G. Isaac & N. Hammond (eds.) *Pattern of the Past: Studies in Honour of David Clarke*, 155-199. Cambridge University Press.

6 PLANT OR WOOL FIBERS? BRONZE AGE TEXTILE FROM THE EASTERN EUROPEAN STEPPES

Author(s): Shishlina, Natalia Ivanova (Head of the Archaeological department)

Presentation Format: Oral

Mats, covers for tools and weapons, seldom preserved fibers and textile fragments as well as textile imprints are very important data for the reconstruction of ancient textile production. Phytolith and isotope data as well as direct ¹⁴C dating of textile samples gives the opportunity to reconsider the roles of early woollen textiles in pastoral society of the Eastern Europe. During the IV and almost all III millennium BC plant fibers were predominant raw material for plating and weaving, i.e. linen in the Caucasus and Low Don region; stems and leaves of wild reed, sedge, gramineous plants – in the steppe and forest-steppe zone of Eastern Europe. Textile uncovered in the grave from Novosvobodnaya dating to the 3000 BC is made of wool and cotton fibers, dyed with tannin and is consider to be imported from some southern regions. Wool fibers and the innovative technology of new type of textile production appeared in the Caucasus and adjacent areas of the steppe zone only since the second half of the 3000 BC where it began to be practiced by local weavers who were keeping use plant fibers as well. Only since the beginning of 2000 BC wool textile and cloth began to spread to the eastern and, probably, to the western European territories. This work was supported by RFFI grant #18-09-00015a.

7 LEPROSY: A LONG TRIP THROUGH EURASIA

Author(s): Serangeli, Matilde (Friedrich-Schiller-Universität Jena)

Presentation Format: Oral

Despite being among the oldest chronic and degenerative infectious diseases in the world, leprosy's origins still remain elusive. Ancient Indic texts and osteological and archaeological evidence suggest the presence of leprosy in India since the 3rd mill. BC, possibly spreading from Eastern Africa or the Near East. Based on whole-genome analysis, the diffusion of the most recent ancestor of *Mycobacterium leprae*, the main causative agent of leprosy, spans from the 13th cent. BC to the 1st cent. AD. Comparative genomics reveals a high diversity of strains of *M. leprae* circulating in Europe during the Middle Ages, which suggests that the disease may have spread in Europe in multiple waves and directions. Scarcity of compelling evidence in historical records preceding the Common Era, combined with the low number of ancient genomes analyzed, suggests that accurate results on its origin and diffusion have yet to come.

Following the path established by D. Anthony for the study of prehistoric migrations, this paper aims at bringing Indo-European comparative linguistics into the investigation of the route of leprosy through Eurasia before the Common Era. The history of the Indo-European lexicon denoting leprosy may have implications in the debate on the dispersal of the Indo-European speaking peoples from the homeland to their historical settlements. In particular, this study may cast light on the controversial separation of the Indo-Iranian branch: should the oldest Eurasian presence of leprosy be located in India around the 3rd mill. BC, then the corresponding Indo-Iranian terminology, i.e. the Indo-European branch to which Old Indic belongs, is expected to reveal a Proto-Indo-Iranian or a Proto-Indo-European origin. Unfortunately, the Indo-Iranian branch itself shows more than one root to express leprosy, and Indo-European terms for leprosy are not exclusive to Indo-Iranian, making it more difficult to identify a Proto-Indo-Iranian or a Proto-Indo-European term for it.

8 GENDER MATTERS. GENDER DIFFERENTIATION AND DIVINE AVATARS IN THE INDO-EUROPEAN PANTHEON: TWO CASE STUDIES

Author(s): Massetti, Laura (University of Copenhagen)

Presentation Format: Oral

In his 2007 ground-breaking book, David Anthony points out how religious beliefs and rituals belonging to the neighbors of the Yamnaya people might have left a trace in the pantheons of Western and Eastern Indo-European traditions: "Western Indo-European religious and ritual practices were female-inclusive, and western Yamnaya people shared a border with the female-figurine-making Tripolye culture: eastern Indo-European rituals and gods, however, were more male-centered, and eastern Yamnaya people shared borders with northern and eastern foragers who did not make female figurines" (p. 305).

In this paper, I will concentrate on two case-studies of 'gender differentiation' in the pantheon of the Indo-European languages, namely, those of (i) the Sun-deity and (ii) the Fire-deity. I will present the data concerning the realm of action/protection of different god(des)s as well as a sketch of the main narratives/motives associated with their figures and cults.

(i) The Sun deity is male in Indo-Iranian, Greek and Latin, feminine in the Germanic and Baltic. However, in connection with the motive of the Sun's wedding, the Sun is mostly associated with the bride, also in Eastern languages. In Vedic, for instance, it's Sūrya's daughter, Sūryā, who marries Soma or the Divine Twins. Is this a clue for a religious feature, which was once connected with 'She-Sun' and was later transplanted in a male-centered pantheon?

(ii) The fire-god(des)'s sphere of action seems to be imagined as very broad and complex. This led to a phenomenon of multiplication and differentiation of the Fire-deities and their divine avatars: the god(des) of the house-hearth (domestic cult and sacrifice), the god(des) of public sacrifice (including funerary rite), the divine smith(s). Is there a way to track down the distribution of roles within the diverse IE pantheons?

The paper will endeavor to provide an answer to these gender matters.

9 WOMEN-SOJOURNERS AND MEN-OF-THE-PLACE? THE EVIDENCE FOR INDIVIDUAL MOBILITY IN EARLY IRON AGE SOUTHWEST GERMANY

Author(s): Arnold, Bettina (University of Wisconsin Milwaukee)

Presentation Format: Oral

Motivated in large part by David Anthony's rehabilitation of migration in archaeological interpretations of social structure and transformation (1990, 1992, 1997) I published an article 15 years ago on differential mobility in the early Iron Age of southwest Germany based on excavations in two tumuli near the Heuneburg hillfort (Arnold 2004). This paper revisits differential gendered mobility in light of the recent completion of the final report of those excavations as well as other evidence for inter- and trans-regional interconnections generated by ongoing projects in the region, including isotope analysis of faunal remains. An unexpectedly large number of burials, not otherwise especially richly outfitted, contain personal ornament and other objects that indicate connections both westward and across the Alpine passes. The mechanisms by which external influences may have affected these populations were quite complex and underscore the importance of David Anthony's call for a more nuanced approach to individual and group mobility in the past.

10

MAKE LOVE NOT WAR: MACRO-ANALYSIS VERSUS SMALL-SCALE HISTORICAL PROCESS OF IRON AGE SETTLEMENTS IN KAZAKHSTAN

Author(s): Chang, Claudia (Independent scholar; Research Associate, Institute for the Study of the Ancient World, New York University)

Presentation Format: Oral

David Anthony's thesis for large-scale mobility among pastoralists and the effects of warfare and conflict in the Bronze Age in Eurasia must be examined in greater detail. The trope of pastoral nomads as fierce warriors has gained currency through the use of analogy with the Scythian and Medieval examples of military confederacies. Anthony suggests at Sintashta settlements in the southern Urals (fortified settlements, metallurgy, increased numbers of weapons in graves, and the appearance of new warfare technologies such as chariots), social complexity leading to chiefdoms was a product of competition and increased conflict/warfare. I wish to contrast Anthony's Bronze Age model for feasting and raiding/fighting to data from the Iron Age settlements of the Talgar Valley in southeastern Kazakhstan.

World-systems analysis can be applied to fine-grained regional studies of Iron Age settlements in the Talgar region. The impact of transformative technologies such as the wheel, horse-riding, metallurgy, can also be noted in the Talgar region. Here, the crafting of pots and 'everyday' tools used in domestic households is a product of both local and regional transmissions of technology. Pastoral mobility based on short-distance transhumance combined with agricultural production of wheat, barley and the two millets at settlement sites dating from 400 BC to AD 100 shows little to no evidence of weaponry. How did nomadic elites control the distribution of land and social alliances necessary for a localized commoner class of farmers and herders to subsist? What strategies were used by nomadic confederacies to forge important networks between the Bactrian empires to the west and the Han Chinese dynasties to the east at the beginning of the formal formation of the silk route(s)? The relationship between a circumscribed agro-pastoral economy and a pan-regional nomadic confederacy typical of Iron Age period provides contrast and comparison to Anthony's discussions.

11

AN ARCHAEOLOGY OF INFORMATION: NEW INSIGHTS INTO CORDED WARE CULTURE

Author(s): Kroon, Erik - Bourgeois, Quentin - Fontijn, David (Leiden University, Faculty of Archaeology)

Presentation Format: Oral

5000 years ago, Europe was fundamentally transformed. From the Volga to the Rhine, Corded Ware Culture rapidly supplanted a patchwork of indigenous cultures. This culture then persisted for half a millennium across its vast distribution. What processes resulted in such a swift and durable transformation?

Recent approaches to this question focus on the internal variability of Corded Ware Culture, or changes in ancestry and mobility during the third millennium BC. However, how does migration result not only in the instigation, but also in the upkeep of uniformity for five centuries? And why is Corded Ware recognisable as an entity if it consists of local variability? To address these questions, we offer a complementary perspective of Corded Ware Culture: An archaeology of information.

This stance interprets the uniform practices and material culture of Corded Ware Culture as emergent social conventions. These uniformities emerge from countless negotiations about the proper course of action between agents who draw on previous experiences and carry results onward to subsequent interactions. Therefore, an analysis of these information exchange can shed new light on the uniformity of Corded Ware Culture.

We illustrate the potential of this stance with two studies conducted within our department. The first example studies the transmission of ceramic technology during the formation of the Corded Ware and its possible implications for understanding this change. The second example applies this perspective of information exchange in a practice-based network approach to unravel the driving factors behind the durable and uniform Corded Ware burial ritual.

12

ARCHAEOLOGICAL, CHRONOLOGICAL AND GENETIC ARGUMENTS FOR MIGRATION. BRONZE AGE OF THE URALS

Author(s): Epimakhov, Andrey (South Ural State University; Institute of History and Archaeology - Ural Branch of RAS)

Presentation Format: Oral

Researchers unanimously recognize the migration origins of the Sintashta antiquities of the Southern Urals. However, the composition of the migrant groups and the participation of the local substrate population are widely debated. The archaeological argument of the migration is a sharp break with the previous local traditions and the emergence of a completely new system of stereotypes (architecture, funeral rites, material culture). Genetic studies demonstrate the heterogeneity of the anthropology for the Sintashta population and the similarity of its genotype with Central Europe. At the same time, new radiocarbon dates show that different traditions existed approximately in one period (the beginning of the second millennium BC). Petrovka, Alakul, Early Srubnaya (Timber-Grave), Seima-Turbino cultures should be mentioned in this list. Seima-Turbino sites are also considered a reflection of the migration from east to west. The cause of the paradox (the illusion of the coexistence of many traditions in one territory), in my opinion, can be explained by a very short period of existence of Sintashta culture and its very rapid transformation into the cultures of the Late Bronze Age.

13 BABIES IN THE AEGEAN BATHWATER

Author(s): Ozturk, Huseyin (American School of Classical Studies in Athens - ASCSA; College Year in Athens)

Presentation Format: Oral

The wide rift and the resulting tension between Classics -the wise, elderly brother of ancient studies- and Archaeology -known for its sophomoric zeal- are well known. It would not be an overstatement, perhaps, to claim that Aegean prehistory is the awkward love child of the aforementioned disciplines, geographically and chronologically connected to both. It is thus inevitable, it may seem, for Aegean prehistorians not to be affected by theoretical tendencies in humanities in general and world archaeology in particular.

However, one vein of thought -which has been in recent decades most emphatically represented by Dr. Anthony- has not been a matter of debate for the archaeologists of the prehistoric Aegean for quite a long time: migration, mobility, babies, and the bathwater. After a troublesome period of the discipline, during which the pendulum always swung towards external stimuli in order to explain cultural change, the Hegelian response has been understandably severe: "internal, local processes can explain all".

Unhelpfully, the truth probably lies in the middle. Certain aspects of cultural change, at a given period and location, may be perfectly analysed and comprehended through mechanisms such as emulation or conspicuous consumption, yet population movements may better explain others. As of late, the latter perspective has been unexplored in Aegean prehistory.

In this paper, David Anthony's theoretical contributions to the study of human mobility will be evaluated in terms of their implications in Aegean prehistory.

14 THE 'ANATOLIAN TREK': RECONSTRUCTING WHEN, HOW, AND FROM WHERE THE ANATOLIAN LANGUAGES ARRIVED INTO ANATOLIA

Author(s): Kloekhorst, Alwin (Leiden University)

Presentation Format: Oral

After the so-called "Ancient DNA Revolution" of the past decade, which has brought many new insights into the genetic prehistory of Europe and large parts of Asia, there can be no doubt anymore that the Indo-European languages spoken in Europe and Central and South Asia were brought there from the late 4th millennium BCE onwards by population groups that stem from the Pontic-Caspian steppes and belonged to the archaeologically defined Yamnaya culture.

Moreover, during the last few decades it has within Indo-European linguistics become more and more consensus that the Anatolian branch of the Indo-European language family occupies a special position: most scholars nowadays seem to accept the idea that the first split in the Indo-European language family was between Anatolian and the other, non-Anatolian branches (including Tocharian), which at that point still formed a single language community that, for some time, underwent common innovations not shared by Anatolian.

Since it is generally assumed that the first genetically traceable large-scale migration out of Yamnaya territory, which gave rise to the Afanasievo culture, is likely to be identified with the 'Tocharian split', the 'Anatolian split' should be dated before that.

In this paper I will present the linguistic data on the basis of which the outlines can be reconstructed of the 'Anatolian trek', i.e. when, how, and from where the Anatolian languages arrived into Anatolia.

15 LINGUISTIC DIVERSITY OF INDO-EUROPEAN AND ITS SPATIO-TEMPORAL EVOLUTION

Author(s): Widmer, Paul (University of Zurich)

Presentation Format: Oral

Eurasia, and hence Indo-European, shows large areas of relative linguistic homogeneity, with few but geographically far-flung language families, while the Americas reveal a rich patchwork of heterogeneity at varying scales and an abundance of small-scale families and isolates. At the same time, genetic and archaeological evidence shows that both regions were originally populated from related regions in East Asia, with some influences and migrations continuing into more recent times. How did the differences between Eurasia and the Americas arise, given their shared origins and connections? One group of theories locates the cause of this in the Americas, positing either rapid, isolated diversification during the initial settlement, accelerated diversification driven by conscious identity preservation, or incomplete language convergence due to shallow time depths. Another group of theories locates the cause in Eurasia, positing rapid homogenization in the wake of intensive and repeated contact during the Holocene. Progress in resolving these questions is hampered by a lack of sufficient resolution in reconstructing the population history between now and the settlement time, by a lack of spatially and temporally explicit models that combine linguistic and demographic data, and by controversies about linking archaeological horizons with reconstructed populations and languages that are difficult to resolve. I will present and discuss an approach that proposes to break out of this impasse by increasing the historical resolution and scope through the modern genomics of humans and domesticated plants and animals, using the resultant demographic histories to constrain models of linguistic diffusion in an explicit spatio-temporal framework of evolution and movement trajectories, and fitting these models not on single families but jointly on multiple families in the same historical region.

ANCIENT DNA, INDO-EUROPEAN LANGUAGES, AND STEPPE PASTORALISM AFTER 30 YEARS

Author(s): Anthony, David - Brown, Dorcas (Hartwick College)

Presentation Format: Oral

Nomads from the steppes have hovered over prehistoric European archaeology for decades. I began to study steppe archaeology in order to untangle the threads that V Gordon Childe and Marija Gimbutas had explored with inadequate data and faulty models. One thread was the domestication of the horse, which Dorcas Brown and I approached decades ago by studying microwear caused by organic bits on horse teeth at Dereivka and Botai, but which we are now able to examine in an entirely new way through ancient horse DNA with collaborators led by Ludovic Orlando. Another thread was the study of human migrations, which I attempted to examine (1990) through processual models borrowed from sociology and demography, now also revolutionized by the recovery of ancient DNA, which has revealed massive migrations from the steppes in the 3rd millennium BC. The Samara Valley Project 1995-2002, co-directed with Dorcas Brown and Russian colleagues, studied the role of agriculture in the evolution of steppe pastoralism. Today we finally are beginning to have the data necessary to integrate the study of Indo-European linguistic origins with correlated data in the fields of ancient human and animal DNA, migration studies, and the evolution of steppe economies and political systems in order to accomplish a level of interdisciplinary understanding that was absent in the days of Gimbutas.

EUROPEAN CRYPT BURIALS - A HERITAGE AT RISK BETWEEN SCIENCE AND PUBLIC DISPLAY

Theme: Interpreting the archaeological record: artefacts, humans and landscapes

Organisers: Majorek, Magdalena (University of Lodz) - Alterauge, Amelie (University of Bern; University of Heidelberg) - Väre, Tiina (University of Oulu) - Grömer, Karina (Natural History Museum Vienna)

Format: Regular session

Church vaults were used as burial places for the local nobility, the bourgeoisie and the clergy between the 16th and 19th century AD in Europe. Due to environmental conditions, the inventory of a crypt is often preserved, including coffins, fabrics, botanical and human remains. These crypts represent the unique opportunity to investigate the funeral customs of this period in great detail: While the coffins are prone to typo-chronological comparisons with their rich decoration and inscriptions, the clothing might be examined regarding style, functionality, material, and chronological era. Archival records provide us with the name, origin, status, and circumstances of death of the buried individuals and allow therefore conclusions on their social and religious background. The mummified and skeletonized human remains reveal not only living conditions and diseases of the early modern elite, but also the post mortem treatment of the corpses. However, crypts are often at risk due to changes to the built environment, cutting off the required ventilation to preserve organic materials. In this regard, conservational interventions are important to the preservation and eventually public display of crypt burials.

During this session, we would like to gather colleagues from Europe to discuss the following aspects of crypt burials and of crypt archaeology:

- social history: development and origin of crypt burial, transformation of funeral rituals, social privilege, distinction and/or cohesion;
- theology: history and context of church burial, funeral liturgy, grave goods, symbols/objects of faith;
- methodology: documentation techniques, methods for identification (church records, DNA), infestation risks;
- ethics: professionalism in crypt archaeology, handling of human remains, accessibility and current use of crypts.

ABSTRACTS

BURIALS UNDER CHURCH FLOORS IN FINLAND – FOLKLORE AND PRACTICE

Author(s): Väre, Tiina (University of Oulu, Archaeology; University of Oulu, Cancer research and translational medicine research unit) - Lipkin, Sanna (University of Oulu, Archaeology; SUNY at Buffalo, Department of Anthropology) - Kallio-Seppä, Titta - Tranberg, Annemari (University of Oulu, Archaeology) - Ruhl, Erika (University of Oulu, Archaeology; SUNY at Buffalo, Department of Anthropology)

Presentation Format: Oral

Present-day church-goers in many of the oldest churches in Finland are often unaware of the mummified human remains beneath their feet. The once so popular practice of burying under church floors has vanished from the social memory. Nevertheless, until the late 18th century, most members of elite were buried under church floors. At the time the custom was sure to stay fresh in parishioners' minds, particularly during the summer, due to the permeating odor of decaying human flesh. A rich, multi-dimensional belief system existed behind the practice. In Finnish folklore a number of stories hint that mummification was not understood as a natural process. A common belief was that the church was filled with "Church people", the deceased, who controlled the churches at night. Funerary attire and small items the likes of coins wrapped in paper or textile, wood chips, brooms, and small coffins for frogs were slipped under floors to expel evil or to cast spells. Thus, depositing the deceased under floors inside family owned chambers was not simply a way to conveniently dispose human remains, although at the northernmost latitudes, in winter, when the ground was frozen, it may even have served as the most practical solution. By the 18th century, the premises under churches were packed full with corpses decomposed in varying degree. Despite the multifaceted beliefs, to clear under-floor

spaces, the older remains of particularly non-relatives were often handled in rather cruel ways.

2 ROTTING CORPSES AND SOOTHING NOSE-HERBS – THE SMELL SCAPE OF EARLY MODERN SWEDISH CHURCHES

Author(s): Kallio-Seppa, Titta - Tranberg, Annemari (University of Oulu)

Presentation Format: Oral

This paper focuses on the smell of death produced by church burials. During the 17th and 18th centuries, when burying the deceased under the church floors was common, rotting corpses often created uninviting smell scape in the churches especially during the warmer summer months. The terrible smell led to solutions to have services outside on the churchyards to avoid sitting inside on the church benches in the fumes.

Certain odour plants were used when placing the deceased in the coffins in funeral and also during the services at the church. The fear of miasma, the idea of diseases spreading through foul smells, together with crowded space under the floors inflicted the burial tradition that was gradually abandoned in individual congregations. Since the late 18th century the under church floor burials have been forgotten in many churches. Changes in the conditions of the churches, such as new heating systems, have brought them to common awareness. After centuries, the partly mummified human remains are in many churches considered a source of putrid smell and health hazard again.

3 „...A GENTLE CALMNESS AND HAPPY RESURRECTION“ – THEOLOGICAL AND FOLK-RELIGIOUS BACKGROUNDS OF CRYPT BURIALS

Author(s): Ströbl, Regina - Ströbl, Andreas (Forschungsstelle Gruft)

Presentation Format: Oral

There has been a lively debate for years if there is a tradition of intentional mummification in Christian Middle Europe. Especially from the early modern period there are hundreds of dry mummies of a social elite preserved in family- and churchvaults. Well ventilated and therefore dry crypt spaces are in most of these cases the reason behind their natural mummification.

Besides the dynastic and representative nature the vaults with their properly sealed coffins were possibly understood as protection spaces for a more facilitated resurrection at the day of judgement. Physical resurrection was church-dogmatical as well as private religious fact from the beginning of Christianity till the 20th century. Numerous inscriptions on coffins and vault walls testify the hope of a „joyful resurrection“.

Resurrection believe is common for all confessions, perhaps protestantism even promoted crypt burials. But only the understanding of the interaction between different social and religious aspects opens up access to the entity „vault“. The lecture shows for the first time how these factors could be linked in contemporary research.

4 CRYPT BURIALS FROM THE CLOISTER CHURCH OF RIESA (GERMANY) – CHANGES OF FUNERARY CUSTOMS, BODY TREATMENT, AND ATTITUDES TO DEATH

Author(s): Alterauge, Amelie (University of Bern; University of Heidelberg) - Hofmann, Cornelia (Museums of Dresden)

Presentation Format: Oral

The cloister church of Riesa (Saxony) contains two burial crypts which were used from the 17th to 19th century AD by the local noble families von Felgenhauer, von Odeleben and von Welck. During the last two centuries, the crypts have experienced severe changes, which could partly be reconstructed through archive records, photographs and oral history.

The aim of the investigations, supported by the parish and the city museum, was to document the current state-of-preservation and to identify the inhumations by combining different types of evidence. The crypt beneath the altar originally contained 50 inhumations of which nowadays 30 are still preserved, either as coffins and/or mummies, while eight individuals were entombed in the northern above-ground crypt.

The coffins were visually inspected and dated by typo-chronological comparisons, and inscriptions were transliterated whenever possible. Materials, fabrication, clothing type, and dating of the garments were determined during textile analysis, preceded by surface cleaning. The mummified remains were subjected to a physical anthropological investigation, including X-ray and/or computed tomography. Different body treatments resulting in natural or artificial mummification could be observed. The X-ray images also revealed hidden fasteners of the garments as well as funerary objects placed in the coffins' padding. In selected cases, samples for aDNA analysis were taken in order to test the kinship between individuals, and stable isotope analysis was performed for the reconstruction of diet, provenance, and age of weaning. Probable identification could only be achieved for the individuals with contextual information; however, the bioarchaeological analyses are still ongoing.

The coffin ornamentation and inscriptions as well as the garments show chronological as well as individual changes from the 17th to 19th century, most distinctive for children burials. They also express a changing attitude to death, reflecting at first devotion and hope of resurrection, later familial affiliation and individual status.

5 FUNCTIONAL ANALYSIS OF GARMENTS IN 18TH CENTURY BURIALS FROM MICHAELERGRUFT IN VIENNA, AUSTRIA

Author(s): Groemer, Karina (Natural History Museum Vienna) - Ullermann, Michael (University of Applied Arts Vienna)

Presentation Format: Oral

The Michaelergruft in Vienna (St. Michaels crypt), Austria, crypt is located near the imperial palace Vienna and has been used between 1560 and 1784 by the local nobility of the city center in Vienna. As the inventory of a large number of coffins has been preserved due to favorable environmental conditions, it offers the possibility to study specific details about the funeral customs of the 17th and 18th century in Central Europe. Selected burials dating to the 18th century from the Michaelergruft serve as case studies for developing new theoretical and methodological approaches in investigating the textiles and garments found in the coffins.

Garments found in crypts usually are analysed due to costume history, aspects of conservation and preparation. Also textile analysis and modern analytical methods are applied to the material. In discussing those garments, questions about the interpretation of the costume arise such as if they are "normal" daily life (or festive) garments or specific funeral costumes. In the following paper criteria are discussed which enable to distinguish between "functional garments" worn also in daily life, "adapted garments" (daily life clothing that has been re-sewn, cut or altered to be used as garment for the dead), and "funeral costumes" that have been deliberately made.

6 TERRA INCOGNITA? EARLY-MODERN CRYPT BURIALS IN SOUTH-WESTERN GERMANY: PERSPECTIVES AND CURRENT STATE OF RESEARCH

Author(s): Sieber, Dominik (Erzbischöfliches Archiv Freiburg)

Presentation Format: Oral

As for Southwestern Germany and Swabia crypt burials can be regarded as terra incognita: scientific research never systematically concentrated on this topic except for the excavation of the seventeenth century burials of the Dukes of Sulz in Tiengen, High-Rhine area. There is seldom any public, museal or touristic display. Preservation activities of historical monuments are excluding them frequently.

In many cases it is not clear how old these crypts or vaults are and which architectural schemes and types existed. In addition there are difficulties in defining what a crypt burial is actually. Evidences of masoned sepultures are dating back to the late Middle Ages and they are connected to nobility, clergy and bourgeoisie. It seems that those structures that were located *infra ecclesiam* (inside churches), could have had a wide spectrum of construction. They were not accessible and only made for the deposition of coffins.

Since the 16th century there are much more records of vaults. In connection with Reformation, Catholic Reform and Confessionalization they were closely connected with buildings of churches and pre-determined them in some cases. For example the new construction of the St.-Martins-Church in Messkirch was from 1526 onwards be geared to the vault of the Dukes of Zimmern. Other Princes imitated the Habsburgs and established in the sign of post-trident Catholicism vaults in monasteries like the Dukes of Königsegg in the Chapuchin-Church of Immenstadt.

The paper wants to give an outline of the current state of research of crypt burials and open up future research perspectives. It will be shown that to date studies in this area have hardly been exhaustive and that interdisciplinary approaches will absolutely be essential.

7 THE ROYAL CRYPT AT PRAGUE CASTLE – TEXTILES RELICS OF CZECH RULERS AND THEIR FAMILY MEMBERS

Author(s): Brezinova, Helena - Bravermanova, Milena (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Oral

The unique collection of medieval and Renaissance archaeological textiles and other objects from Prague Castle is a highly important source for knowledge of the material culture of the highest social class of this time.

A large number of these items made up the furnishings of coffins of the Luxembourg and Habsburg dynasty members buried in the royal crypt in St. Vitus Cathedral built by Bohemian King and Holy Roman Emperor Charles IV around 1350. Two hundred years later, during the rule of Emperor Maximilian, the crypt was moved several meters further west and a mausoleum was constructed above it. Charles IV (*1378), his four wives, his sons John from Görlitz (*1396) and Bohemian King Wenceslas IV (*1419), later Bohemian kings Ladislaus the Posthumous (*1457) and George of Poděbrady (*1471) were buried in the lower part of the crypt. Habsburg rulers – Ferdinand I (*1564), his wife Anna Jagellonica (*1547) and Maximilian II (*1576) – were buried in the upper part, the remains of Maximilian's daughter (*1580) and Rudolf II (*1612) again in the lower part. The crypt was opened several times over the centuries and coffins were also exchanged.

All funerary equipment was removed by a large-scale reconstruction of the crypt in 1928, after which they become part of the Prague Castle collection. The objects have recently been restored and their detailed research is currently being finalised. Most of them are deposited in the depository and are partially displayed in a permanent or short-term exhibition.

Since the collection dates back to 1928, contemporary scientists do not have to deal with the ethical problem of disturbing the final resting place of historical figures. However, it is clear that crypts should be opened when required by their technical condi-

tion not to cause a sensation.

Supported by the project GACR 19-00166S.

8 THE BURIAL VAULTS OF THE ROYAL HOUSES OF CENTRAL EUROPE, PAST AND PRESENT

Author(s): Weiss-Krejci, Estella (Austrian Academy of Sciences)

Presentation Format: Oral

Throughout the centuries the royal burial vaults of central Europe such as those belonging to the houses of Habsburg, Wittelsbach, Württemberg, Thurn and Taxis, Zähringen, Hohenzollern, etc. experienced the addition and reorganization of coffins within the crypt, destruction, and renovation and reconstruction. This paper discusses the diverging processes that influenced the style of coffins, coffin iconography, as well as the arrangement of coffins within the crypts and identifies similarities and differences between them. The style and symbolism on the coffins can usually be attributed to ideology and fashion but other processes were also at work within the burial vaults. Family ties and family size and the continuation or disruption of blood lines are the major causes for abandonment or enlargement of crypts, political conditions were often responsible for destruction and exhumation. The phenomenon of crypt visits, both past and present, and the identity of some of the visitors to the burial vaults will also be discussed.

9 STUDIES OF THE 19TH-CENTURY CRYPTS OF THE RECTORS AND PROFESSORS AT THE MOSCOW ACADEMY OF DIVINITY'S DEDICATED CEMETERY (SERGIEV POSAD)

Author(s): Engovatova, Asya - Mednikova, Maria - Vasilieva, Elena (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Researching crypts – the tombs of Russia's elite of the Tsarist era, and the difficulties of excavating them, and cooperation with the secular and ecclesiastical communities - studies were conducted by the IA of RAS at the historic cemetery of Russia's largest monastery, the Trinity-St Sergius Lavra. Research centred on the cemetery of Moscow Academy of Divinity – Russia's foremost institution of religious education.

Problems arise from the tombs in the cemetery being destroyed over the 1920s-30s, during the USSR's struggle against religion.

The Academy's authorities wished to locate the burials of the most prominent of the professors

Research began in the archives, alongside comprehensive geophysical (radar and magnetometric) surveys. Three burials rows were identified, which did not correspond to archival materials. However, archaeological excavation confirmed the geophysical findings.

Excavations uncovered and identified 32 burials. Age and gender of the deceased were determined, with non-destructive anatomical studies performed using laser 3D scanning and photogrammetry, in addition to microfocus X-ray diffraction.

Important data was retrieved by study of their apparel -including, for example, the buttons of their uniforms.

Forensic examination compared period photographs of the teaching staff with skulls retrieved during excavation, using an overlay technique.

Anthropological and forensic procedures made it possible to confirm the burial locations of the teachers. The remains were reburied after identification, and solemnly reinterred in a service of commemoration.

The comprehensive studies included archaeological, anthropological, paleological, paleopathological, geo-radar, and forensic practice. along with study of historic costume. These made it possible to confirm the burial locations of 12 of the Academy's professors – all of whom were eminent Russian academics in the fields of history, philosophy, and theology.

10 FUNERARY VESSELS AND ORTHODOX BURIAL CUSTOM

Author(s): Panchenko, Konstantin (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Funerary vessels in Christian Orthodox burials are part of a widespread phenomenon, which is not yet fully understood. Funerary vessels were adopted as the logical extension to existing antique practice, rather than developing as an Christian innovation. It is important to note that not all Byzantine cemeteries have graves with vessels, this suggests that the burial vessel was not a mandatory attribute of the Christian funeral rite. It is known that the tradition to put the vessel in the burial place existed until the Ottoman conquests. Burial contain generally in the medieval Byzantine Orthodox cemeteries ceramic or glass juglets and balsamaria, occasionally bowls. Most Byzantine funerary vessels have a narrow high neck and an oval body. In male burials find vessels more often than in female. The Russian Orthodox funeral rite is a direct heir to the Byzantine tradition. According to this tradition, after the consecrated oil poured on the deceased the vessel should be put in the coffin. In early stage Russian Orthodoxy ware in graves find seldom or never. Only from the 15 century in Moscow funeral vessels there are on most monastery and Church cemeteries. It should be noted that the percentage of burials with vessels in Moscow is very close to the data on Byzantine graves. Among the burial vessels of Russia dominated bowls, juglets are not found in any burial. All Russian burial vessels were not made specifically for burial, they were also used in everyday life as lamps, inkpots, jorams. According to gender and age indicators, the following situation is recorded in medieval Russia: male burials with vessels (78%) significantly dominate over female burials (22%); there are no funerary bowls in persons younger than 20 years. Funerary vessels discovery in Byzantine and

Russian tombs imply a common cultural and ritual context.

A. COFFIN GARDENS - FAUNAL AND FLORAL REMAINS FROM CHURCH GRAVES OF THE COAST OF BOTHNIAN BAY (FINLAND)

Author(s): Tranberg, Annemari (Oulu University)

Presentation Format: Poster

Both animal remains and plant fragments in graves tell a lot about the ceremony, burial circumstances and the deceased. They also report events after burial; how the mummification or purification process has progressed or what happened in and outside the coffin after burial. This poster focuses on the following questions; What plant species did people put into coffins and what happens after the burials? What insect species are found? The discussion concerns the church graves dating to 17th- to 19th-century Tornio, Keminmaa, Haukipudas, Oulu, Hailuoto and Kempele. The area seems to have typical Swedish and Nordic features, but indicators of locality and migration can be seen as well. For example, the use of birch bark is distinct in the rural island of Hailuoto. Like regular gardens, these "coffin gardens" reflect the cultural and natural environments around them. Coffins were filled with plants and fragrances. They mirrored the Garden of Eden, in a sense. Everyday life and feasts were visible in burial ceremonies as much as practice and symbolism. Traditional manners held their role in the community while new trends arrived.

B. EIGHTEENTH-CENTURY COFFINS - "BIOGRAPHY OF THINGS"

Author(s): Majorek, Magdalena (Institute of Archaeology, University of Lodz)

Presentation Format: Poster

In recent years, work has been intensified in churches and cemeteries. Archaeological excavations often reveal burials in coffins. Contrary to what the term "biography of things" may suggest, the theoretical approach referred to as this does not only apply to the material aspects of objects. More than the physical description of material culture (e.g. shape, color, dimensions of a given object), the biography of things focuses on the multiplicity, variability and diversity of the meanings of things (and places) throughout history.

The variety of coffins inspired me to develop them in a very broad context. I set the following aims:

- cognitive aim - documenting (descriptive, photographic, drawing) of a unique archaeological legacy of modern funeral rites, one of the material manifestations being wooden coffins, elaboration and making the results available to a wider audience;
- methodological aim - the use of archaeological research methods that could be used in the study of modern funeral rites through the use of integrated procedures for obtaining archaeological sources, both in situ and with minimal interference in their structure and their analysis;
- community aim - identification of burials on the basis of coffins and preservation of the memory of the deceased, whose existence in social consciousness and values assigned to them serve to maintain individual and collective identity.

Can such a study be called a biography? What problems did I struggle with and which aspects did I neglect to do research on? And all this on the example of coffins from the church crypts in Szczuczyn (Poland).

376 ISLAMICATE ARCHAEOLOGY IN EUROPE

Theme: Archaeological theory and methods beyond paradigms

Organisers: Duckworth, Chloe (Newcastle University) - Koval, Vladimir - Beliaev, Leonid (RAS) - Carvajal, Jose (University of Leicester)

Format: Regular session

All too often, the archaeology of Islamicate societies in Europe finds an awkward fit in European historical narratives, attaching to but not interacting with them, which leads to them being studied separately from their more recognisable European (i.e. Christian) counterparts. This leads to the substantial remains of Islamicate archaeological heritage being presented, outside very restricted academic circles, as the manifestation of a timeless, ahistorical and orientalist reality. The only historical role of these societies seems to have been to interrupt the "natural" historical evolution of some European regions or, in some cases, to act as passive instrument for the construction of the national genealogies of European nations.

This simplifies the interpretation of these societies through the lens of Eurocentrist perspectives on the East, which boils down the complexity of non-European societies into a fixed set of clichés that require little theorisation. Furthermore, though it typically recognises the colonial nature of the Islamic conquest, it ignores the colonialist phenomena that resulted in the demise of these societies, which are covered by the umbrella of various "reconquistas" and "processes of independence".

This will be the third EAA session on Islamicate archaeology in Europe, following initial successes in 2017 and 2018. We welcome papers on Islamicate cultural heritage and archaeology in, or significantly relevant to, Europe.

ABSTRACTS

1 ISLAMICATE ARCHAEOLOGY IN EUROPE (INTRODUCTION)

Author(s): Duckworth, Chloe (Newcastle University)

Presentation Format: Oral

Welcome to the third EAA session on Islamicate archaeology in Europe, following initial successes in 2017 and 2018. All too often, the archaeology of Islamicate societies in Europe finds an awkward fit in European historical narratives, attaching to but not interacting with them, which leads to them being studied separately from their more recognisable European (i.e. Christian) counterparts. This leads to the substantial remains of Islamicate archaeological heritage being presented, outside very restricted academic circles, as the manifestation of a timeless, ahistorical and orientalist reality. The only historical role of these societies seems to have been to interrupt the "natural" historical evolution of some European regions or, in some cases, to act as passive instrument for the construction of the national genealogies of European nations.

This simplifies the interpretation of these societies through the lens of Eurocentrist perspectives on the East, which boils down the complexity of non-European societies into a fixed set of clichés that require little theorisation. Furthermore, though it typically recognises the colonial nature of the Islamic conquest, it ignores the colonialist phenomena that resulted in the demise of these societies, which are covered by the umbrella of various "reconquistas" and "processes of independence".

2 ISLAMIZATION BEYOND CONVERSION TO ISLAM

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

Presentation Format: Oral

In this presentation I propose to reconsider the concept of Islamization to get over the idea of religious conversion. Archaeologists have not developed their own approach to the concept of Islamization in spite of having the conceptual tools to do so since at least the 1990s. They have instead considered the concept as associated to the idea of individual conversion to Islam, as it has traditionally been done in the field of humanities. However, this ultimately leads to a paradox, because there is no way that individual identities can be explained with reference to rational individual choices.

I will explore the ways in which the study of conversion has inexorably led to a consideration of Islamization as socialization, in spite of not abandoning the idea of individual conversion as the ultimate causal element of Islamization. My suggestion is that we should abandon the concern with the link between Islamization and conversion and that we should explore the ways in which archaeological theory can approach Islamization in a post-colonial and post-Orientalist framework.

3 ARCHAEOLOGICAL SIGNS OF ISLAMIC IDENTITY IN THE CITY OF BOLGAR

Author(s): Koval, Vladimir (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Religious identification markers are an important field of research in modern archeology. There are quite a lot of markers of Christian identity: these are crosses-pendants, that were worn both under and over clothing, temple buildings, signs of the cross and special formulas of inscriptions on various objects. However, the Islamic symbol similar to the cross did not exist. Thanks to written sources, there is now no doubt that the majority of the population of the city of Bolgar, one of the largest cities in the state of Volga Bulgaria, which adopted Islam in 922, was Muslim. We list the main signs of Muslim identity, recorded in Bolgar according to archeology:

- Numerous Muslim burials. Stone gravestones with Muslim arabographic epitaphs and Muslim (Arabic by origin) names are also known.
- Stone buildings of mosques and mausoleums.
- Specially built stone buildings for public baths.
- Inscriptions in Arabic, including quotes from the Koran.
- Absence (or extremely small number) of pig bones in the cultural layers of the Bolgar.

Interestingly, although it is difficult to doubt the Islam identity for the bulk of the Bulgar population in the pre-Mongol era, there is almost no direct evidence of Islamic identity for this period - all the above signs are characteristic only for the XIII-XV centuries. However, this is due to the small size of the city X-XII centuries. and little excavated area.

4 MUSLIMS ON THE MARGINS? ISLAMICATE ARCHAEOLOGY OF THE WESTERN EURASIAN STEPPE

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

Presentation Format: Oral

Archaeology as a discipline with its Eurocentric past continues to be plagued by nationalist discourses and political agendas. Their aim is to push the material presence of Islam out of sight to the margins of the mainstream historical narrative. Yet, in many cases archaeology represents the only means of learning about the Islamic conversion or the existence of Muslim communities in a territory marked by the absence of medieval texts. The medieval Western Eurasian Steppe with its predominantly mobile communities of pastoral nomads is precisely such a region. There, the archaeological material culture derived mainly from mortu-

ary contexts reveals a complex set of indigenous ritual practices that gradually become transformed by the encounter with Islam by the 10th century CE. The archaeological visibility of this process cannot be denied, but archaeological interpretation—and its subsequent integration into the mainstream historical narratives—continues to relegate nomadic Muslims to the margins of history. In this paper, I would like to address a number of such cases, where the archaeological interpretation of medieval nomadic graves from the Caspian-Pontic steppe has led to heated polemics whereby their Muslim attribution is downplayed and ignored. A comparative approach will be used in order to contextualize these polemics and archaeological cases.

5 THE EASTERN GLAZED POTTERY IN THE LOWER VOLGA REGION IN THE PERIOD FROM X TILL FIRST HALF OF XIV CENTURY

Author(s): Boldyreva, Ekaterina (State Historical Museum)

Presentation Format: Oral

The glazed pottery appears in the European part of the territory of Russia from X century. It was found of the archaeological layers Old Russian cities and in the Volga Bulgaria. The glazed pottery from the eastern countries was quickly spread over the long distances. The main water arteries in this time were formed Dnieper and Volga trade routes.

The South part of Volga trade route includes the Samosdelka settlement. Its geographical location makes it possible to call the settlement as the first stop-transshipping place of trades, which moving from the Caspian Sea to the North. The trades from Central Asia, Iran, Transcaucasia and Middle East stayed here.

In the second half of X-XI centuries in the Lower Volga region there are the glazed vessels from different regions of Central Asia. Moreover, early ceramics did not get geographical spread outside the region. At the turn of XI-XII centuries, the south-west orientation in the trade relations begins to develop. The first pottery with frit body are brought from the territories of Iran. Vessels from this region begins to get into a place of remote regions: Volga Bulgaria and north-eastern outskirts of Old Rus. In the XIII century, there were formed new ways of trade routes of region, which associated with the forming of the Golden Horde state. The strengthening the positions of Islam in the region contributed to the development of trade relations with Egypt and Syria. The “lustre” pottery produced on the Middle East began to penetrate into the Lower Volga Region and spread far beyond.

The glazed pottery is the main part of the material culture of the population of the Lower Volga. It is a kind of marker illustrating the history of the Lower Volga Region through the prism of relations with other regions.

6 SAN ESTEBAN ARCHAEOLOGICAL SITE: LIVING ON THE OTHER SIDE OF THE WALL OF MADINAT MURSIYÂ (XI-XIII CENTURIES AD)

Author(s): Celma Martínez, Mireia - Eiroa Rodríguez, Jorge - Haber Uriarte, María - González Ballesteros, José - Hernández Robles, Alicia - Corraliza Gutiérrez, Ana - Muñoz Espinosa, María - Salas Rocamora, Sergio - Martínez Rodríguez, Antonio (University of Murcia)

Presentation Format: Oral

The urban area of Murcia (Spain) stashes beneath its surface the medieval archaeological site of Madinat Mursiyâ, located along the Segura valley, which foundation dates back to the IXth century AD. Several medieval buildings and a part of its urban system were uncovered through planned and emergency archaeological activities during the last decades.

In 2009, an extraordinary discovery took place at the northwestern, on the other side of the medieval wall. The dig of this area partially unearthed the La Arrixaca arrabal, developed in the XIth century AD as the direct result of the demographic pressure within the first walls of the medieval city. The increasing number of inhabitants boosted the territory with new and complex irrigation ditches and crop production in the fertile countryside. The urbanism and its preserved underground drainage to the sanitary sewer system sufficiently proved an efficient management of wastewater and its maintenance through the centuries. In addition, monumental buildings as the interpreted as a ‘funduq’, prove the economic importance of the arrabal. In the limit of the site, there is an oratory where was found a small ‘maqbara’ next to it.

The recently created project “San Esteban Archaeological site” (<http://sanesteban.um.es/>) started an interdisciplinary research thanks to the collaboration between the University of Murcia and the City Hall. The principal aim was to sustain the excavation in order to examine the remains of the most extensive medieval site discovered in Europe through the most recent archaeological techniques. Various archaeological disciplines and bioarchaeological analyses are combined to compare the results obtained on the written sources. A more precise understanding of the organization of these areas outside the walls in Islamic cities and some new hypotheses about its functioning are expected. The project is also a complement to the teaching program addressed to Bachelor’s degree and Master students.

7 HETERODOXY IN THE EARLY ANATOLIAN ISLAM: AN ARCHAEOLOGICAL CONTEXT

Author(s): Dikkaya, Fahri (TED University)

Presentation Format: Oral

In the early periods of Islam in Anatolia, from the 12th century to the 14th century, the Islamic contexts was determined by heterodoxic phenomena based on the Anatolian and Central Asian shamanistic traditions. In this period, the heterodoxic Islamic practices impinged upon material culture of the new converted or coming Islamic communities in the Medieval Anatolia. These esoteric currents demonstrated themselves as natural symbolisations and spolia on the material culture. These practises and

currents were transferred from Anatolia to the South-eastern Europe by Ottoman expansion. In this expansion, the heterodox Turkmen religious leaders played crucial role to found a new colonization area with these heterodoxic practises in the European Islam. This paper will be focused on heterodoxy and its unique Islamic practises on material culture, especially architectural elements and religious materials, in the Medieval Western Anatolia and the Balkans through the archaeological perspectives. The archaeological survey about these phenomena will contribute to understand current local European Islamic contexts in the Balkans.

8 THE SELJUK STONE CARVING OF THE LATE 14TH - EARLY 15TH CENTURY: JERUSALEM, ANATOLIA, CRIMEA AND MOSCOW

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

Presentation Format: Oral

Russian architecture of the 12th c. borrowed its ornamentation from Lombardy or Palatinate. The churches were embellished by the small arches-and-columns belt and freely placed decorative, or the full carpet pattern. After the Mongol invasion and up to the late 13th c. Russians erected almost no monumental constructions. Churches of the 14th c. did not survive. And the cathedrals of the early 15th c. look quite unexpectedly. The composition is extremely simple: facades are divided by the three carved bands placed between the two levels of windows, at apses and the drum. The motif of the carving is vegetation.

The idea of the paper is to understand the genesis of this ornamentation. Its Oriental character is evident and an attempt to explain it as the transfer from the Seljuk art was made long ago. But it was not accepted in Russia. The new materials of Anatolia are able to support the idea of the Oriental transfer and to draw the itinerary of it. The nearest spring of the motifs is located in the region of the former Byzantine state densely populated by the Armenians and Greeks of the Inner Anatolia of the 13th-14th cc. (Susuz Han, Nigde, Kayseri of Cappadocia). Rare examples could be found at Jerusalem (Turbat Turkan-Katun, mid 14th c.) and in Cairo, were they are connected with the Seljuk patrons. One of the motifs is well known arabesque, originated at the Far East and brought to the Mediterranean world by the Nomads. The road from the Seljuk Anatolia to Orthodox Moscow led through the architecture of the Crimea. In the 14-15th cc. it was an important part of the Golden Horde and Genoese Mediterranean trade.

9 THE CULTURAL HERITAGE OF SELJUK'S AND EARLY OTTOMANS IN ARCHAEOLOGY OF EASTERN EUROPE

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

Presentation Format: Oral

The archaeological investigation of Eastern Europe put the question of cultural heritage of Seljuk and Early Ottoman. The beginning of this process dated by the end of 12th – first decades of 13th century. Some Seljuk's elements fixed in architecture and jewelry art for elite layer of Old Russ society. The further Seljuk's innovations connected with the Golden Horde period in the large area from Western Podolia to Crimea. It includes different kind of archaeological monuments of North Black Sea area. Their influence became more strong and large, represent the monumental architecture and applied art. It reflect the next stage of the development of Seljuk culture, enriched with elements of Islamic traditions.

The appearance of the Early Ottoman culture connected with the expansion of the Ottoman state to the North. Crimea became in vassal dependence. The North Black Sea was in their power with key positions in the mouth of biggest rivers in the North Black Sea. It was time for creation of the Islamic infrastructure inside of the territory and penetration of different types of artefacts (ceramics, weapons, carpets and others) inside and outside of border of Empire, in Ukrainian lands and other regions of Eastern Europe. One of the more visible part of material culture was ceramics. On the early stage of Ottoman influence (at the end of XV at the beginning of XVI century) it was "Miletus ware" and early styles of Iznik ware (Abraham of Kutahya, Blue- and- White, Golden Horn and Damascus), which reflects the time of its penetration and spreading into the North Black Sea area. Turkish artefacts come into other regions of Eastern Europe by different ways, such as presents, trophies or goods of trade.

10 OTTOMANS IN PODOLIA (UKRAINE)

Author(s): Vynogrodska, Larysa (-)

Presentation Format: Oral

After the Ottomans captured Podolia for 27 years (1672-1699), the Turks owned the province. An ejleth was created with the center in the city of Kamenets-Podolsky and the main castles were seized, where Turkish garrisons stood. Castle towers and monasteries rebuilt into minarets. Gradually, Turkish culture penetrated Ukrainian life and its manifestations are especially noticeable in ceramics. During the excavations of cities and castles in Podolia, fragments of pottery from Turkish ceramic centers (Kütahya) are often found. Jugs with spout, washstands and plates with wide shores decorated with abstract multicolor ornamental motifs inherent in Islamic cultures ("marble" ornament). Such dishes are found on all monuments during archaeological excavations in Podolia. In the 18th century, this ornamental motif spreads throughout Ukraine and becomes national. Attention should be paid to the manufacture of pipes, where the fusion of European and Islamic cultures is combined. During the excavations in Kamenets-Podolsky, a cradle was found with a Turkish stamp from one side and a gentry coat of arms from the other side and the inscription "Satans". The influence of Turkish culture is reflected in the ornamentation of tiles of this period. Thus, we can say that Turkish culture spread among the Ukrainian people and was processed to suit their tastes.

11 THE CONVERSION OF MOSQUES INTO CHURCHES IN GREEK MACEDONIA AFTER ITS ABSORPTION TO THE GREEK STATE (1912-1913)

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

Presentation Format: Oral

The religious reuse of buildings that had served other cults has been an old and common practice since antiquity. When Christianity became the state religion of the Roman Empire, most pagan temples were converted into churches. The symbols of the old faith were either removed or destroyed but the buildings continued to be used as sacred spaces. There are many similar examples from different parts of the world and from different historical periods. In Iberia after the Moorish conquest, churches were converted into mosques. After the Reconquista, mosques were converted into churches. The reasons for the reuse vary and are dependent on the historical context. The main reason could have been practical but there is also symbolism involved in these actions and in some occasions, respect of the sacred space. The reuse of a building does not erase its material presence nor its past history, it only inscribes to it new cultural, social or political meanings. It is another chapter in the cultural biography of the monument. When the Ottomans conquered Macedonia in the 15th century, they gradually converted the Byzantine churches into mosques. In 1912, after the Balkan Wars and the defeat of the Ottoman Empire, Macedonia became a province of the Greek state. During same year, all the Byzantine churches of Thessaloniki converted in the past into mosques were reconsecrated back to the Christian religion. In 1924-1925 after the Treaty of Lausanne thousands of Muslims from Greek Macedonia were exchanged with thousands of Greeks from Turkey. Many mosques in cities and villages were converted into churches. In this paper I will present how this was practiced and to what extent. I will also present some surviving architectural examples and discuss issues concerning their identity as carriers of different temporalities and memories.

A. THE CITY OF THE KAZAN KHANATE AS AN EXAMPLE OF INTERACTION BETWEEN ISLAMIC AND CHRISTIAN CULTURES

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

Presentation Format: Poster

In recent years, the expedition of the Kazan University discovered and is actively investigating (head S.Valiulina) the unique monument in the central part of western Kama Region - previously unknown town of the 15th c. The town Toretsky differs by its originality and richness of material culture, the scale of international trade highly developed craft, multiethnic and multi-religious population. The collection of artifacts obtained as a result of the excavations is mainly made up of products from local workshops that worked using patterns and traditions of Islamic culture of the late Middle Ages. Artistic metal tableware, a copper incense burner, women's jewelry and belt sets, cast iron boilers are particularly expressive in this regard.

In this city of the Kazan Khanate, the presence of not only Muslims, but also of a population professing Christianity is indicated by finds of cultic objects (a small icon and crosses, the cross - encolpion), Russian everyday and glazed ceramics and by pork bones in archaeozoological materials. The location of Russian dwellings in the center of the town, the presence of expensive status materials in these houses, show that people living in those houses were not slaves.

Cultural interaction is observed in the nomenclature and forms of household products, in "hybrid" samples of earthen vessels, oriental in their function and form, and Russian in terms of the composition of clay dough and decor. But it is especially important that the most numerous group of ceramics in the town (more than 40%) are pot-shaped dishes of red-burning clay, with an admixture of fine sand without polishing and engobe. Such dishes dominate in the 15th century in Russian cities, including Moscow and Nizhny Novgorod. In the Kazan Khanate, besides Toretsky, it is well known in the Khan layer of Kazan and in some other towns.

382 THE PRESENTATION, INTERPRETATION AND CONSERVATION OF ARCHAEOLOGICAL AND HERITAGE SITES: TRANSNATIONAL, DIACHRONIC AND MULTIDISCIPLINARY PERSPECTIVES. PART 1

Theme: Archaeological theory and methods beyond paradigms

Organisers:

Format: Regular session

This session incorporates papers that are dealing with various archaeological sites from the Paleolithic to the medieval period, allowing a comparative view of diachronic and transnational trends on human lifestyles and traditions. The understanding of cultural change is key question of different multidisciplinary approaches, ranging from archaeozoological and technological to literary and landscape studies.

In addition, we are welcoming studies on preventive archaeology and conservation of archaeological heritage sites across countries, which involve conventional or modern documentation techniques. An important aspect is how the value of these sites is communicated to the general public, especially in times of crises.

ABSTRACTS

1 ALWAYS ON THE MOVE AND NOT PERCEIVED – ON THE TRACE OF ITINERANT CRAFTSMEN IN THE IRON AGE

Author(s): Winkler, Alexandra (University of Zurich)

Presentation Format: Oral

In the literature Iron Age craft seems difficult to separate from the concept of specialisation. Production units concentrated in a unique place are identified by high quantities of production waste. For the settlement with small quantities of craft waste, we find the craft activity mentioned and classified as occasionally. If the settlement on its own is not identified as crafts, the remains are often not of interest anymore. However, the circumstances of these occasional craft activities should be researched. Which kind of activity produces this type of waste? Does this activity need a specific know-how? Which social group is involved in the production of this kind of waste?

These questions can't be answered certainly for all kinds of crafts. The mentioned procedure can be observed preferably with the metal craft. The metal craft needs a certain know-how, particular tools as well as specific raw material. Also the good conservation of the remains (wroughts slags, cast drops) enable the research about the itinerant craftsmen.

Is it possible to identify archeologically the existence of the itinerant craftsmen? What kind of remains and which methods are available for the archaeologist? On the base of tool finds, craft waste and their context we have the possibility to determine the existence of itinerant craftsmen. Subject of the consideration are secondary settlements as well as some central settlements of the Hallstatt period. Form and style of certain objects give us information concerning the mobility of ideas, innovation and human beings. The results of the archaeology can be supported by ethnographic examples. Itinerant craftsmen can be found quite often in ethnographic studies and enable new approaches by analysing them. The aims of the lecture are to investigate the possible existence of a group of persons not often perceived in the prehistoric archaeology.

2 FROM THE LATENIZED OKSYWIE CULTURE TO THE ROMANIZED WIELBARK CULTURE. OUTLINE OF CULTURAL CHANGES IN POMERANIA (NORTH POLAND)

Author(s): Chrupek, Sebastian (Institute of Archeology Warsaw University - Warsaw)

Presentation Format: Oral

This presentation covers an issue of cultural transformations that has occurred at the end of the 1st century BC (end of the Pre-roman period) in Pomerania, occupied by population of the Oksywie culture at the time. Their culture is characterized by burial funeral rite, varieties of weapons and "love" for iron. Evolutionary transformations which took place in the last 50 years of the first century BC on the southern coast of Baltic Sea, led to development of the Wielbark Culture at the 1st century AD (Roman period). Typical traits of this culture are biritual funeral rite, a multitude elements of outfit made with non-ferrous metals, and lack of weapons which is connected with "iron taboo". Cultural contrast between the Pre-roman and Roman period had been noticed at the beginning of the 20th century and was interpreted as a result of migration of the Goths tribe. Furthermore, the materials of both cultures at the same cemeteries were explained by the respect of new arrivals to their predecessors, formerly connected with Burgunds. This theory was undermined by Dr. Ryszard Wołagiewicz in 1965. He marked a chronological transitional phase for one of the Oksywie-Wielbark necropolis, emphasizing the evolutionary character of changes and the importance of the local substrate in shaping the Wielbark culture. This cultural change is also part of the wider issue of civilizational changes that took place in the Barbaricum, when at the turn of the era Celtic influences were undergoing crisis and the interactions from the Roman Empire were intensifying. Presenting the analysis of three cemeteries from the pool of several dozen Oksywie-Wielbark necropolises, the author attempts to understand a serious cultural change on the southern coasts of the Baltic Sea at the turn of the era, which will be necessary for his further research at the PhD dissertation level.

3 INTRODUCTION: ROMAN NATURE AND THE BEGINNING OF THE ANTHROPOCENE

Author(s): Mandich, Matthew (ISAR)

Presentation Format: Oral

In the last two decades the current, unprecedented environmental crisis has led many scholars to radically rethink the anthropocentric model of Empire, centred on the control of ideology, politics, economics and the military, and instead acknowledge the central role played by nature in shaping social power (e.g. Elvin & Ts'ui-jung 1998; Mikhail 2013). At the same time, the scientific validation of the Anthropocene, a new geological epoch functionally and stratigraphically distinct from the Holocene, dramatically confirmed the overwhelming and irreversible influence that human activities have on our planet. When this new epoch began is highly debatable, but huge environmental impacts from human activity certainly occurred in the Roman period due to the increased scale of urbanisation, production, and consumption. Given the growing awareness of the indelible mark we make on the planet, this panel will look back at one of the largest power networks of the past, the Roman Empire, to re-examine Roman perceptions of nature, power, and power over nature to help us better understand our present situation. By offering a lively and challenging setting for discussion from nature writers like Robert Macfarlane to Roman scholars like Kyle Harper, the panel will foster new approaches to explain the relationship between human societies and their natural environments, providing a novel interpretative framework for current and past environmental crises.

4 ANTHROPOCENE OR URBANOCENE?

Author(s): Hanson, John (John Hanson)

Presentation Format: Oral

One of the most important variables in our assessment of the impact of human activities on the environment is the extent to which the number of people living in cities changed over time. In this talk, I will begin by offering new evidence for the estimated numbers of residents in individual cities, which attempts to go beyond earlier work by drawing on multiple lines of evidence based on the built environment. I will then discuss how we can use a combination of this evidence and a chain of statistical techniques to not only suggest new estimates for the size of the urban population in different periods and estimate the growth rates of individual cities, but also to assess our degree of uncertainty, i.e. the margin of error, in these estimates. I will then reflect on what having a better sense of the sizes of cities can tell us about some of our most important proxies for how the socio-economic conditions of the Roman world changed over time, such as the recent evidence for lead-pollution from ice-cores, and what bearing this has on the complex inter-dependencies and inter-relationships between people, cities, and resources that characterised the Roman Empire.

5 ENVIRONMENTAL CHANGE AND LANDSCAPE EVOLUTION IN ROMAN AND EARLY MEDIEVAL LISBON INFERRED FROM PALYNOLOGICAL AND SEDIMENTOLOGICAL ANALYSES

Author(s): Currás, Andrés (Institute of Heritage Sciences, CSIC. Santiago de Compostela) - Costa, Ana Maria (Laboratório de Arqueociências - LARC/Direção-Geral do Património Cultural - DGPC - and EnvArch / CIBIO / InBIO, Lisboa; Instituto Dom Luiz - IDL, Universidade de Lisboa) - Freitas, Maria da Conceição (Instituto Dom Luiz - IDL, Universidade de Lisboa) - Bugalhão, Jacinta (Direção-Geral do Património Cultural - DGPC; Centro de Arqueologia - UNIARQ, Universidade de Lisboa) - Lopes, Vera (Instituto Dom Luiz - IDL, Universidade de Lisboa) - Danielsen, Randi (-)

Presentation Format: Oral

Landscape evolution and environmental change in Lisbon have been addressed by the use of multi-proxy analysis, including pollen, non-pollen-palynomorphs and sedimentological data preserved in a sedimentary core retrieved in a sub-tidal area of the northern Tagus margin.

Four radiocarbon dates indicate that the record covers from 1st century cal AD to late 6th century cal AD. Data cross-check with available archaeological information of the city enables for the reconstruction of palaeoenvironmental dynamics during circa 600 yr period at high resolution. Main results evidence that the area of Lisbon was an open landscape with little woodlands and high human impact at least since the 1st century cal AD. A higher influence of human activity has been identified in early 3rd century cal AD. A change in the sedimentary record has been identified in early 3rd century cal AD that can be related with natural events or higher human activity. A marked sedimentological change occurred in early 4th century AD, coincident with the late Roman period, and suggesting a change in the behaviour of the Tagus tributaries. A new phase of increase human impact has been identified in late 5th century cal AD.

The diverse rhythms of environmental change occurred in accordance with social and political evolution of the area and evidence the usefulness of transdisciplinary and multi-proxy approach in landscape archaeology studies.

6 THE UPPER PALAEOLITHIC SITE GAGARINO – THE LOCAL VARIANT OF KOSTENKI-AVDIEVO CULTURE? (BASED ON THE MATERIALS OF BONE INDUSTRY)

Author(s): Baskova, Varvara (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The site Gagarino is located in European part of Russia in 45 km northwest of Lipetsk on the left bank of the river Don. The site was opened in 1926 by S. Zamyatnin, and it became the first site in Russia where Upper Palaeolithic dwelling with household pits and the series of mobile art was uncovered. In 1960-s excavations were continued by L. Tarasov. Radiocarbon dating of the site showed the interval between 22.000 and 20.000 years BP (non cal). Most of researchers attributed Gagarino as the site of Eastern Gravettian and particularly Kostenki-Avdeevo culture despite of original features of its inventory.

In this research the bone industry of the site Gagarino have studied in complex for the first time. The inventory includes fragments of faunal remains with the traces of processing, artefacts made of bone and ivory on different stages of production, which reflect household (needles, awls, smoothers, spatulas), hunting (points) and symbolic (personal ornaments, female and anthropomorphic double statuettes) sides of life. Technological and typological analysis have demonstrated the wide range of tools assemblage and variable technics of processing raw materials. The percentage of ivory artefacts is rather high. Most of female figurines are related to special Khotylevo-Gagarino type. On the one hand, considering relatively small size of the collection and frames of one dwelling, subjects of mobile art are prevailed in the collection, but on the other hand, there are practically no household and hunting tools with elements of ornamentation or figure decoration.

Thus, the results of the research showed that the developing level of processing raw materials and the range of categories in bone and ivory inventory are stayed in frames of common technologies of Kostenki-Avdeevo culture and the Eastern Gravettian in general, however, its look have differences, originality and unique features.

7 SAMSHVILDE: CULTURAL TRANSITIONS THROUGH THE CENTURIES (SOUTH CAUCASUS)

Author(s): Berikashvili, David (University of Georgia)

Presentation Format: Oral

Samshvilde, a settlement in southern Georgia, is a complex and multi-period archaeological site. The site occupies a strategic and impregnable location on a basalt cape flanked by the gorges of the Khrami and Chivchava rivers. This distinctive landscape position, combined with environmental conditions that include a mild climate and an abundance of natural resources, have attracted human occupation for millennia. Samshvilde and its surroundings have been inhabited since the Neolithic era; In Bronze period the area was used by people as a settlement and a cemetery. But the urban complex of the site increased mainly to the medieval period, when it became the region's main fortress and political-economic center. Proximity to the northern branch of the Silk Road further increased the site's importance. Samshvilde was therefore a place where various ethnic groups and cultures converged. In the early six century Sasanians were replaced by Arabians, while from the ninth century the site fell under the influence of Armenian kingdom of Ani. During the late medieval period Georgian, Persian and Ottoman cultures were replacing each other. Anyway, despite the site's importance and such a longevity, until recently there has been little concerted archaeological study of Samshvilde. In 2012 the Samshvilde Archaeological Expedition was initiated by the University of Georgia which has taken a multi-disciplinary approach to the site. The cultural changes during the centuries, new archaeological contexts and artifacts will be presented, as well as the main approaches, the results of interdisciplinary studies and the challenges of the project.

8 DISSOLVING LITURGY FROM MONUMENTS – THE CASE OF CAROLINGIAN CHANCEL SCREENS

Author(s): Meier, Thomas (Institute for Pre- and Protohistory and Near Eastern Archaeology, Heidelberg University)

Presentation Format: Oral

Decorated chancel screens guiding movement in the interior space of churches and partly equipped with curtains to control the view between the nave and the choir were common features in Roman churches from the 4th century onwards and material expressions of the processional conduct of a specific liturgy in the city of Rome. The number of churches furnished with chancel screens exploded during the 8th and 9th centuries, when they became common features not only in Central and Northern Italy and the Adriatic, but also north of the Alps and in parts of Gaul. Frequently this seemingly vast and quick spread of chancel screens is connected to the reform of liturgy in the Frankish empire, which deliberately adopted the Roman liturgy including the processions within and between several churches.

But taking a closer look on the distribution of chancel screens in comparison to the main area of liturgical reform as mirrored in the distribution of revised liturgical textbooks both areas seem to be mutually exclusive, while other regions like the diocese of Milano, which deliberately stayed with its own traditional liturgy, are densely dotted with chancel screens. This observation raises various questions: Were – in the perception of the Carolingians – chancel screens connected to a specific type of liturgy at all? If not, why did they spread just around the second half of the 8th century? And what did the Carolingians perceive as typical of the Roman liturgy?

9 STONEHENGE: AN ASTRO-ARCHAEOLOGICAL ANALYSIS

Author(s): Tiede, Vance (Astro-Archaeology Surveys; SEAC)

Presentation Format: Oral

This paper considers the theoretical efficacy and practical limitations of Hawkins' "Stonehenge as Neolithic computer" interpretation in light of "numerical artifacts" revealed by archaeology (Hawkins 1964, 1967; Colton and Martin 1967; Dibble 1976; Hoyle 1977; Ranieri 2003; Malström 2011). For example, at least ten (including two previously unpublished) "numerical artifacts" in the architecture of Stonehenge are consistent with systematic observation of the sun and moon on the local horizon, e.g.: latitude; rational right triangle; number/placement of archaeological features; and reciprocal luni-solar horizon vectors.

The research objectives are: (1) to enumerate the numerical artifacts in Stonehenge's architectural design capable of recording the Lunar Synodic Period (29.53 days), Regression of the Lunar Nodes Period (18.601 years), Metonic (19-year) Cycle, and "Stonehenge 56-Year" (lunar node regression/eclipse) Cycle (Hawkins 1967); and (2) to test the utility and limitations of Hawkins' eclipse warning hypothesis with NASA solar and lunar eclipse data (Espenak 2016) and Starry Night Pro Plus-6 digital simulation (cf. Malström 2011). For example, if the 56-Year Cycle correctly predicts more often than not that a midwinter (winter solstice +/-15 days) lunar eclipse will be visible after the full moon rises in the same horizon position at 19:18:19-year intervals, then it would be more reasonable than not that the architects of Stonehenge had knowledge of both the 19-year Metonic Cycle (lunar phases) and 56-year Cycle (regression of the lunar nodes) as evidenced by the 19 stones of the Bluestone Horseshoe and 56 holes of the Aubrey circle (Hawkins 1965, 178). The significance of the proposed research is to offer a rationale for major/minor lunar standstill alignments (cf. Schaeffer 2007) found in Bronze Age religious architecture (e.g., ziggurats; Tiede 2018) and numerical artifacts in Bronze Age astronomical records (e.g., cuneiform tablets; Neugebauer 1955; Friberg 1981, 2005; Sachs & Hunger 1988-2006).

10 “SPERM-WHALE” AND “CROZIER” - ORIENTATION AND CENTRALISMS IN EARLY NEOLITHIC BRITTANY, 4900 – 4000 BC

Author(s): Maeder, Stefan (Freiburger Institut für Paläowissenschaftliche Studien - FIPS)

Presentation Format: Oral

Based on archaeological, astronomical, and symbological evidence, results concerning two literally central motifs from Early Neolithic ritual contexts are introduced. Both occur on central-capstones and supports in passage-graves, as well as on menhirs. Hitherto published archaeological interpretations of both motifs, the “sperm-whale” (fr. “cachalot”) and the “crozier” (fr. “crosse”), represent significant progress, yet remain somewhat abstract and vague (Cassen, 2011; Whittle, 2000). The basic astronomical phenomenon of the earth’s axial precession within ca. 25.800 years still goes largely unnoticed by archaeology.

“With respect to spatial orientation, navigation, chronometry and underlying aspects of funerary culture, the apparent and changing centre of the cosmos, i.e. the Northern Celestial Pole (NCP), and conspicuous circumpolar constellations played a significant role in prehistoric Europe.”

Since 2009 this working hypothesis proved valid in a variety of instances between Japan and Ireland. Corresponding principles are not only supported by evidence from early civilisations in Eastern Asia and the Middle East, but also from ancient Greece and Rome (Maeder, 2011). Applying Stellarium software to reconstruct ancient skies allows for a determination why the seemingly disparate motifs of an abstracted “whale” and a “crozier” occur in combination regularly. In 2017 closely matching constellations of the “sperm-whale and the crozier” were identified as concrete and still easily verifiable pole-finders during the Early Neolithic in Brittany. These not only provide a detailed explanation for accepted regularities concerning megalithic funerary and ritual monuments, but further elaborate most recently published results in support of a “maritime diffusion model for megaliths in Europe” (Paulsson, 2019). Figuratively appearing at the interface between Mesolithic and Neolithic ways of life, the combined occurrence of a marine mammal – supposedly indigenous - with an apparent pastoral tool/weapon – apparently imported – in Brittany holds further clues towards a more accurate evaluation of an early European “hard rock phenomenon”.

11 DOMESTICATED RHYTHMS: THE CULTURAL APPROPRIATION OF NATURAL CYCLES IN HOLOCENE SOUTHWESTERN ASIA AND EUROPE

Author(s): Rosenstock, Eva (Einstein Center Chronoi, Berlin; Institut für Prähistorische Archäologie, Freie Universität Berlin)

Presentation Format: Oral

Temporal rhythms, such as dormancy, vernalization and germination or birthing seasons, growth or lactation periods as well as harvest seasons, are inherent to all living beings. While hunter-gatherer ways of life require only the knowledge of such cycles, subsistence based on plant cultivation and animal husbandry is often associated with the active modification and appropriation of these natural rhythms for human benefit. So far, however, investigation of the effects of domestication in the Southwestern Asian to European trajectory of Neolithization has focused on more tangible aspects like size and yield. Changes to the Eigenzeit of the domesticates involved are now researched as a project within the framework of the new Einstein Centre Chronoi in Berlin dedicated to investigating time and related aspects such as awareness of time, time management, time reckoning and temporality in the cultures in interdisciplinary and transdisciplinary formats. The paper draws attention to ways the perception of time, speed and rhythm may have changed in early farmers when they knowingly and unknowingly manipulated the timing of their domesticates - plants, animals or even microbes.

A. HANDEDNESS EXPERIMENTAL STUDY: TESTING SPATIAL DISTRIBUTIONS AS AN INSIGHT INTO PREHISTORIC HANDEDNESS

Author(s): Ben Brahim, Oumeyma (Faculté des Sciences Tunis El Manar; Mongil School Rades) - Holden, Chloe (Cognitive Science Program Indiana University; Stone Age Institute) - Hlubik, Sarah (Rutgers University) - Braun, David (George Washington University)

Presentation Format: Poster

Researchers interested in the evolution of language and cognition have been studying handedness through the archaeological record, as it appears to be related to the hemispheric lateralization of language processing centers in the brain. Previous studies focused on features found on stone tools, such as the orientation of the cortex, cone of percussion, parabolic crack, extraction axis, hackles, ripples, erillure scars, structure and inclination of the striking platform, location of the impact point, and fractures on broken flakes. However, replication studies have been unsuccessful at validating original claims. This pilot study investigates whether the spatial distribution of flakes after a knapping session could give information about the handedness of the knapper. Two knappers (one left-handed and one right-handed) used three different types of raw material (ignimbrite, basalt, and chalcedony) to create 2x2 meter experimental knapping sites. Photogrammetry of the experimental site was used to build orthomosaic models that were then imported into QGIS to map the coordinates of the flakes. Optimized Hot-Spot Analyses (OHSA) were conducted to determine if materials are clustered within a specific area. OHSA results of samples made by both knappers overlap and a paired T-test confirmed there were no separations of pattern for any raw material ($p = 0.78$ for ignimbrite, $p = 0.92$ for chalcedony, and $p = 0.79$ for basalt). Future studies should take into consideration the size class of the flakes included in the sample. There is the possibility that a difference in the spatial distribution is related to artifact size. Larger flakes may reflect a pattern in the spatial distribution that is not reflected in the smaller debitage pieces.

B. DISTORTION AND FRAGMENTATION BEFORE WETLAND DEPOSITION, THE FINAL TRANSITION OF IRON AGE OBJECTS

Author(s): Treadway, Tiffany (Cardiff University, SHARE)

Presentation Format: Poster

Iron Age objects found within wetland contexts in Britain are notorious for their altered state before deposition. In comparison to the preceding Bronze Age and proceeding Roman period, Iron Age objects found within a wetland context have the highest percentage of purposeful fragmentation and distortion of objects. This alteration of state has been explained by many as a conscious removal from circulation. It has been theorised that these objects have been charged with some form of power or pollutant, and regardless of length of circulation, they need to be altered in some manner upon their exit from usage. However, this data can be easily skewed because the majority of Iron Age objects reported from a wetland context are metal. Objects of a different material type may have a distinct method of depositional practice, but this is difficult to dispute. When for example, wooden objects have only gained value archaeologically since the discovery of various major wetland settlements throughout Britain in the 1960s. Additionally, objects such as the Roos Carr figurines (Yorkshire), are assumed to be votive because they are incomplete. However, other theories could also be valid - such as a child losing their toy in transit. Therefore, this project aims to analyse objects curated in museums and private collections or recorded through various digital platforms such as the Treasure Trove and the Portable Antiquities Scheme in a holistic manner. The purpose of this is to re-interpret preconceived notions of socio-cultural interaction with what is considered peripheral and at times liminal landscape. This project serves to analyse object transition and withdrawal from terrestrial use to wetland deposition, from whole to fractured, from straight to bent, from fire to water, and other evolutions or changes of an objects' personification within a community through the collection of object data.

C. THE MODELING OF CULTURAL LAYERS ON SETTLEMENTS IN THE WEST SIBERIA

Author(s): Zelenkov, Alexander - Shibeko, Egor - Tretyakov, Evgeny (University of Tyumen)

Presentation Format: Poster

The settlement archaeology of the West Siberia has urgent problem at interpretation and division of multiple archaeological cultures and types. Today this situation, which formed in 20th century in view of domination of formation approach, contradicts modern methodological paradigm and typological constructions. However, many of modern researchers use stereotype about infrangible connection between ethnos and archaeological culture. Therefore, medieval archaeological cultures of the West Siberia have wide dating and periodization based on ceramics diversity that in our opinion seems like unstable construction, which require a new facts and arguments. For instance, Bakal culture dates from IV to XIII AD and associates with the Tatar people, Yudino culture dates from VII to XIII AD and associates with the Mansi people. This chronology demonstrates "evolution development" of concrete ethnos, but it does not reflect archaeological reality and typology features.

In this connection our research aims to verify chronological sequence of archaeological cultures on multilayer archaeological sites of the West Siberia based on materials of key settlements: Krasnogorskoe, Kolovskoe, Papskoe, Ust'-Tersyuskoe, which dating between 1st and 2nd millennium AD. In Maple and Voxler programs more than 5000 shreds of ceramic vessels analyzed in multidimensional space according to stratigraphy indicators and radiocarbon dating. Thereby was recreated the structure of main cultural layers, including Bakal and Yudino types. We detected two episodes of exploitation of settlements in the Middle Ages: 1) IV-VIII AD - the Migration period with Bakal materials; 2) IX-XIII AD - the Cuman-Kipchak confederation period with Yudino artifacts. Now we see that logically right interpretation for this periodization will be local sequences instead of evolution.

In this way, the modelling of cultural layers can show objective cultural structure of archaeological assemblage and renew old paradigm.

D. NEU-MED PROJECT: NUMISMATIC RESEARCH AND LEAD ISOTOPE ANALYSES OF MEDIEVAL COINS FROM TUSCANY (ITALY)

Author(s): Villa, Igor (Universität Bern; Centro Universitario Datazioni e Archeometria, Università di Milano Bicocca) - Benvenuti, Marco (DST, Università di Firenze) - Bianchi, Giovanna - Cicali, Cristina (Università di Siena) - Chiarantini, Laura (Università di Firenze) - Donati, Alessandro (Università di Siena) - Rovelli, Alessia (Università della Tuscia, Viterbo) - Volpi, Vanessa (Università di Siena)

Presentation Format: Poster

The nEU-Med project (Origins of a new economic union, 7th-12th cent.: resources, landscapes and political strategies in a Mediterranean region) investigates the transformation processes between 9th - 12th cent AD in the Colline Metallifere District (CMD), southern Tuscany, in the framework of the new, broader system of trade and cultural exchanges between northern and southern Europe. nEU-Med integrates archaeology, archaeometallurgy, geoarchaeology, archaeobotany, physical anthropology, and physical chemistry. Excavations on "mining castles" of the CMD (Rocca San Silvestro, Rocchette Pannocchieschi, Montieri, Cugnano) demonstrated that the development of local seigneurships in this geographical context was deeply linked to controlling and exploiting polymetallic Cu-Pb-Ag ores. These were mined at least since the 11th-12th cent AD, as testified by historical documents and abundant heaps of metallurgical slags (dated to 11th-14th centuries), found within mining castles. Their supposed use for coinage remains still uncertain. Numismatic, chemical and lead isotope analyses (LIA) of coins circulating in the CMD between 9th and 12th-13th century AD address these questions. LIA on ca. 140 silver and silver-copper coins from different mints (Pavia, Lucca, Siena and Pisa) were compared with isotope compositional fields of historical mining districts: Tuscany

(CMD, Apuane Alps), Aquitaine (Melle), Rhenish Massif, Harz, and Erzgebirge. The conclusions narrow the possible metal sources used for coins circulating in the CMD between 9th and 12th-13th century AD.

E. LATE PLEISTOCENE OCCUPATIONS OF COASTAL KACHCHH, INDIA

Author(s): Blinkhorn, James (Department of Geography, Royal Holloway, University of London) - Ajithprasad, P - Mukherjee, Avinandan (Department of Archaeology and Ancient History, MSU Baroda)

Presentation Format: Poster

Prominent models of modern human expansions from Africa and across Asia emerged at the turn of the millennium that have prioritised coastal corridors of dispersal, arguing that it would require a single ecological adaptation to maritime habitats. Over the past 20 years, the absence of any direct archaeological evidence to support such models has been striking, whereas arguments for a shared cultural origin for microlithic technologies in southern Africa and South Asia (a key component of such models) have been directly assessed and rejected. GIS-based models have illustrated the plausibility of coastal corridors of expansion around the South Asian coastline in the Late Pleistocene, but also indicate the high probability of dispersals along river valleys into the interior of the Indian subcontinent, where the majority of Palaeolithic sites are found. We have undertaken the first dedicated Palaeolithic survey of coastal Kachchh, India, located immediately east of the Indus delta and at a key biogeographic threshold marking the end of the Saharo-Arabian deserts and the start of the Monsoonal realm. Here, we present the results of survey and excavations integrated with palaeoenvironmental evidence for Late Pleistocene occupations that demonstrate Palaeolithic engagement with coastal landscapes in India.

383 THE PRESENTATION, INTERPRETATION AND CONSERVATION OF ARCHAEOLOGICAL AND HERITAGE SITES: TRANSNATIONAL, DIACHRONIC AND MULTIDISCIPLINARY PERSPECTIVES. PART 2

Theme: Archaeological heritage and museum management: future chances, future risks

Organisers:

Format: Regular session

This session incorporates papers that are dealing with various archaeological sites from the Paleolithic to the medieval period, allowing a comparative view of diachronic and transnational trends on human lifestyles and traditions. The understanding of cultural change is key question of different multidisciplinary approaches, ranging from archaeozoological and technological to literary and landscape studies.

In addition, we are welcoming studies on preventive archaeology and conservation of archaeological heritage sites across countries, which involve conventional or modern documentation techniques. An important aspect is how the value of these sites is communicated to the general public, especially in times of crises.

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ABSTRACTS

1 (3D) SURVEYING OF THE NEOLITHIC CIRCULAR DITCH ENCLOSURE "QUEDLINBURG I" (SAXONY-ANHALT, GERMANY)

Author(s): Chowdhury, Annabelle - Bornhöft, Jan (Freelancer)

Presentation Format: Oral

The research project "Built Knowledge" (Prof. Dr. Dr. h. c. Wolfram Schier, Institut für Prähistorische Archäologie, Freie Universität Berlin) is dedicated to the phenomenon of Neolithic circular ditch enclosures (so-called "Kreisgrabenanlagen") of the 1st half of the 5th millennium BC in middle Europe.

The fieldwork at the site "Quedlinburg I" (Saxony-Anhalt, Germany) combined two archaeological excavation techniques: the creation of artificial layers as well as digging for strata. The application of (3D) surveying methods – tachymetry and Structure from Motion / photogrammetry – enabled the digital documentation of the excavated surfaces of archaeological and geological structures.

The creation of detailed 3D models of the complex Neolithic structures, which integrates "traditional" documentation methods, facilitates a variety of resultant analyses: In depth-study of the cross-sections of the ditch provided evidence of its construction and several recutting phases. Volume calculations of the backfilling enabled to assess the find distribution in relation to the depth of the ditch. Examining the different strata and their slope angles provided evidence of past aboveground structures, such as ramparts, flanking the ditches.

Furthermore, visualisation has always been an important part of archaeological work. Modern technology does not only give us the tools to process data but also to create accessibility to our results. Therefore, we created 3D models of the circular ditch enclosure that can be viewed without any special resources.

Thus, the reconstruction of complex stratigraphic contexts of features, strata and/or finds and its visualisation based on methodically heterogeneous documentation is feasible and reasonable.

In the research project "Built Knowledge" the synthesis of archaeological fieldwork and applied digital (3D) survey methods is significant for the interpretation and visualisation of archaeological features. So far, the excavations at the enclosure "Quedlinburg I" revealed most of its conception and building history.

2 SURVEY AND ANALYSIS METHODS FOR STUDY OF THE EARLY BRONZE AGE OBSERVATION SITE OF LINSMEAU AND BONLEZ (BELGIUM)

Author(s): Heller, Frederic (Public Service of Wallonia) - Anslijn, Jean-Noël (Awap) - Broes, Frédéric (Inrap) - Gaspani, Adriano (Inaf) - Motta, Silvia (Inaf)

Presentation Format: Oral

Presentation of the methods used for the survey and analysis of the astronomical observation site of the Early Bronze Age of Linsmeau and the Ground Lidar survey methods of the Middle Bronze Age site of the Bonlez bell barrows (Bt).

We used and mixed data from the total station, Drone, Lidar and photographic surveying to create a precise 3D model of the archaeological site of Linsmeau in its geographical context. These results were incorporated during a joint work week with the Boltzmann Institute Vienna (Austria). We then used the Stellarium software, an astronomical simulator, which allowed us to verify and validate our hypotheses regarding the astronomical marker function of the Linsmeau posts alignments in 1800 BCE.

Following our study of Linsmeau, we carried out conservative Lidar surveys on the Bonlez Bell Barrows, it is part of the same process of using new technologies for the study of archaeological sites. We then treated the data using various open source softwares.

3 3D MODELING OF ROCK ART SITES: CLARIFICATION OF DETAILS AND REVEALING OF PREVIOUSLY UNKNOWN IMAGES

Author(s): Levanova, Elena - Laskin, Artur (Institute of Archaeology Russian Academy of Sciences) - Svoisky, Yuri - Romanenko, Ekaterina (RSSDA Lab)

Presentation Format: Oral

Work on the contactless documentation of boulders and rock surfaces in petroglyphic sites of the Far East (Sikachi-Alyan, Sheremetyevo, and Kiya on the Amur and Ussuri) is carried out as part of projects funded by the Institute of Archaeology RAS and the Russian Foundation for Basic Research.

To document the surfaces of basalt boulders and vertical rock outcrops with petroglyphs, a new technique for analyzing the model surface was developed, which made it possible to significantly increase image recognition and tracing elaboration. Fragments of polygonal surface models with images were converted into topographic models (elevation maps), which were used for tracing proper. The contours of the processed and unprocessed surface were recorded not along the illumination border, as when dealing with a conventional photograph, but along the bends of the surface identified by mathematical visualization of the model's relief. The use of this technique made it possible to perform a three-dimensional drawing of the contours of petroglyphs, compare known images with tracings from the 1960s - 1970s, and reveal previously unknown drawings.

As a result of the works in 2017-2018 polygonal textured models of 81 boulders and surfaces with petroglyphs were obtained. The total surface area of the models is 211.5 m², the average modeling detail is 3.2 thousand polygons per cm². 17 previously unknown images were identified conclusively.

The study was funded by the Russian Foundation for Basic Research # 17-29-04389, # 17-01-00511-OFH.

4 THE FUTURE OF AERIAL PHOTOGRAPHY IN ARCHAEOLOGICAL HERITAGE MANAGEMENT. THE DUTCH CASE

Author(s): Van Londen, Heleen - Korver, Iris - Schelvis, Morgan (University of Amsterdam)

Presentation Format: Oral

Aerial photography is of major use for landscape archaeology. The Netherlands no longer has a basic infrastructure in place for aerial photography in archaeology. It is thought to be outdated due to the wide variety of possibilities offered by LiDAR technologies for tracing and mapping potential archaeological sites. Newfound interest into 'aerial archaeology' was sparked during the summer of 2018, when the country experienced a drought. Old features within the landscape became visible and enthused numerous (para)gliders and a KLM-pilot to take photographs. The following research has shown that there is public interest and academic value in reestablishing such basic infrastructure. Moreover, we see various opportunities that may very well lead to policy innovations in archaeological heritage management. We are presently assessing ways in how this could be done, while at the same time establishing how this serves modern heritage approaches. The future infrastructure needs to take into account the public participation, the automation of the analysis of (satellite) imagery, and the implementation of landscape coherence in the basics of archaeological heritage management complementing the site level. It is essential to base this infrastructure on the

public participation of (para)gliders and drone pilots, who initiated the preliminary research.

5 MACHINE LEARNING TO DETECT VIKING-AGE CULTURAL HERITAGE SITES ON A NATIONAL SCALE

Author(s): Kristiansen, Søren (Department of Geoscience, Aarhus University; Centre for Urban Network Evolution - UrbNet, Aarhus University) - Stott, David (Department of Geoscience, Aarhus University; Moesgaard Museum, Højbjerg) - Sindbæk, Søren (Centre for Urban Network Evolution - UrbNet, Aarhus University; Department of Culture and Society, Aarhus University)

Presentation Format: Oral

Ring fortresses in southern Scandinavia are a significant, if short-lived, phenomena of the formation of the early medieval kingdom of Denmark. Together with the contemporary fortified towns they arguably represent a systemic expression of centralized authority, and the regular spacing of the five known examples suggests that undiscovered sites may exist. Establishing whether more ring fortresses existed would be of great importance to our understanding of the Northern European political circumstances of the late 10th Century CE. In the last years novel mathematical approaches have proven useful in other scientific fields, with machine learning and artificial intelligence being most successful, whereby large datasets and large areas can automatically be investigated to detect and classify features of interest. However, successful applications of these methods in archaeology seems so far limited. In this paper we discuss the utility and results of machine learning approaches to automatically detect candidate sites for Trelleborg-type ring fortresses from the entire country of Denmark using airborne laser scanning data.

6 COMMUNICATING ARCHAEOLOGY AT POGGIO DEL MOLINO. 3D DIGITIZATION AND THE RESEARCH BENEFITS

Author(s): Baione, Carlo (Past in Progress)

Presentation Format: Oral

Traditionally, archaeology has developed standard practices for artefacts or structures representation that are intended to facilitate an understanding for specialized researchers. Today 3D modelling approaches in archaeology remain critical around questions of fidelity, representation and user experience, while being widely used and recognised as a means of transforming the remains of ancient cultures into visual and narrative media for the presentation of history.

In 2015 the Archeodig project began exploring the potentials of 3D modelling as implementation of the existing classical methods to document the remains of the Roman archaeological site of Poggio del Molino (Populonia, IT). The team is currently documenting the scientific discoveries with a Structure-From-Motion photogrammetry (SFM) workflow, which is proving to be non-labour intensive and, compared to traditional approaches to hand drawing in archaeology, very efficient in terms of time. The choice of SFM positively affected the quality of data bringing more 2D and 3D information about the site, whose scientific relevance seems to offset any storage capacity issue.

The 3D digital documentation produced on site at Poggio del Molino is having a clear impact on the way archaeologists read the site's overlaying structures, and for this it is becoming a practical tool for a thorough understanding of the multi-layered archaeological site. Additionally, selected 3D content of the Roman site is being published online on Sketchfab and it is helping the communication of the scientific research to the public of specialists and non-specialists (<https://sketchfab.com/PArCo-poggiodelmolino>). In fact, the use of 3D models online is enhancing Poggio del Molino's public events and lectures, guided tours and local conferences and is actively helping the preservation of artefacts and structures discovered in the last 10 years of field activity.

7 A DISCOURSE WITH ARCHAEOGAMING & DIGITAL HERITAGE: DOES THE FUTURE FOR ARCHAEOLOGY LAY IN THE IMMATERIAL?

Author(s): Hanussek, Benjamin (University Of Warsaw)

Presentation Format: Oral

"Like films & books video games are cultural texts. They say something about the society in which they were made" (Knoblauch 2015:187)

Since decades digital games are on a cultural conquest in becoming the "Leitmedium" of a century. This particular form of media diffuses through borders of gender, culture and socio-economical strata of any country. The importance for the field of archaeology to participate in the issue of establishing a proper way to deal with this medium is unquestionable. We are facing the emergence of an enormous amount of data in form of Digital Heritage through those games which already started to decompose.

Therefore, archaeologists and anthropologists have already begun their work on creating approaches to excavate and analyse digital games to not just preserve those digital sites but also to define their cultural significance.

My talk tries to highlight the chances and possibilities but also the shortcomings of approaches like Andrew Reinhard's Archaeogaming and the general idea of reading digital games as contemporary artefacts. For that I intend to use the case of the ATARI Game Burial in 2014 and my own experiences in the game Assassin's Creed: Odyssey in which I applied several approaches of pioneering scholars in this new emerging field to illustrate methodological issues and theoretical conflicts (temporality, materiality & ontology) between the current scientific framework of Archaeology and its application on digital heritage in the case of digital games.

8 CONSERVATION AND RESTORATION OF MUDBRICK STRUCTURES AT THE TEMPLE OF MILLIONS OF YEARS OF THUTMOSIS III IN LUXOR

Author(s): Gamarra, Agustín (Conservator-restorer)

Presentation Format: Oral

Since 2008 a multidisciplinary Spanish-Egyptian project has been carried out in the temple of Millions of Years of Thutmosis III, in Luxor-Egypt. A large part of the architectural structures of the temple were made with mud bricks, among which stand out: the Pylon, the enclosure wall, floors of the courtyards, the storage areas, the houses of the priests and the foundations. This circumstance gives a prominent role to the restoration processes of the above-mentioned areas. In order to conserve and exhibit this type of structures, we created a protective layer with the same recycled materials from the excavation itself, using the same construction techniques as the ancient Egyptians. Many mud bricks with interesting marks are allowing a study on various construction stages, techniques and organization of the builders of this temple. To build the protective layer, we use the skills and the materials of the local building tradition. This choice improves the relationship between the archaeological scientific team, with the local people working together, and this item is the main factor for the conservation of the archaeological site.

9 TWO MUSEUMS IN DIALOGUE. LOCAL AND INTERNATIONAL CONNECTED RESEARCH CENTERS ON CULTURAL HISTORY AND HERITAGE AT THE HORN OF AFRICA

Author(s): Palestrina, Daniel (Joint Venture International)

Presentation Format: Oral

The initiative, until today private and partly from the Swiss Federal Government funded, realised on the base of culture, science and education, an interesting new approach to connect a society in a difficult political context of a long-term civil war and divergent state development on their common Somali-Culture-Base, with a common development process trough their two destroyed museums in a continuously dialogue together. The project bases itself is since end of 2015 on the polythematic and interdisciplinary development.

Development of rebuilding and renewal of the two museum institutions in their urban contexts with the content programing as follow:

- The Somali Museum of Anthropology and Archaeology Hargeysa (SMAAH), as a socio-cultural centre of a local educational and international research institution for the topics of prehistory, anthropology, archaeology, and cultural history of the Somali region.
- The Somali Museum of History Mogadishu, as a socio-cultural centre of history of the newer history until to the contemporary times today.

Through their individual focus they will be encouraged to be in an active dialogue with each other, the local, regional population and the international community. The tasks include the primary analysis in its cultural, social, political and economical contexts, the preparation of the highly professional scientific developed content. For this a polythematic preparation, the management of an interdisciplinary planning of the project and its context development and architectural tasks as well, is necessary. The project developments include also an urbanistic intervention to integrate them both into their different urban contexts.

The ongoing implementation:

- Building of the fundamentals of society, government, science, funding, design
- Concept and management planning
- Development of sustainable stabilisation
- Urban and architectural development and planning
- Partner network development is local, regional and international
- Team building

10 CHANGING MATERIALITIES IN A MEDITERRANEAN TOWN

Author(s): Kulenovic, Igor (University of Zadar)

Presentation Format: Oral

A sense of historicity is one of major narratives of modernity. This epoch went at great lengths to constitute a form of subjectivity where the past has a major role. Hence, history is not discovered but rather invented, constructed and mobilized in an effort to construct a certain form of identity appropriate for a particular form of collectivity (the Nation). However, these processes occur, not only at a discursive level in terms of ideas and ideologies but at the level of material practices as well.

Zadar is a midlevel, historic town situated at the eastern Adriatic coast. During the WWII it suffered devastating destruction during several bombing campaigns. A major renewal project was undertaken by the authorities, building the whole town practically anew. The remains of the past were not treated as isolated items to be adored as monuments. On the contrary, they were deliberately and consciously integrated in the fabric of the new city. Therefore, the monuments were contextualized in a such a manner as to become a part of people's everyday lives.

Whereas modernity strived to constitute a totalizing living experience for a great number of people, the processes which are taking place recently go in a completely different direction. The experience of a historic town now seems fragmented by comparison, reducing the town to a set of atomized practices. The town is tailored to suit individuated needs most appropriate in the context

of tourism. These issues will be demonstrated on a case study of Zadar, a historic Mediterranean town.

11 THE ARCHAEOLOGICAL CULTURAL HERITAGE IN ALEPPO AND THE SURROUNDING AREA (SYRIA)

Author(s): Al Najjar, Mustafa - Del Fabbro, Roswitha - Kanjou, Youssef - Fansa, Mamoun - Kohlmeyer, Kay

Presentation Format: Oral

Since 2011, the war in Syria has been raging. This war has not only caused human casualties and infrastructure damage but also included the destruction of the monuments -the basis of the cultural identity of the Syrians, especially the old city of Aleppo as a UNESCO World Heritage site suffered much during this war.

The Antiquities Authority, local community, and many international cultural institutions showed a clear desire in the reconstruction of Aleppo. Unfortunately, there is no systematic database for the archaeological heritage in the city of Aleppo and its surroundings at the Antiquities Service in Aleppo due to their strictly limited financial, technical and staff resources. For that, the Antiquities Service will only be able to respond to the forthcoming rehabilitation and infrastructural measures instead of co-decide about them.

In November 2017 the Gerda Henkel Foundation approved the archaeological cultural heritage in Aleppo and the surrounding area project.

The aim of the project is to supply the Antiquities Service in Aleppo with professional support for documenting the archaeological relics before and during soil intervention measures, and during construction projects of any kind, also for recovering or in-situ conservation of the relics in the case of relevant structures. The collection of data helps to evaluate the archaeological findings, and aids in determining the appropriate methods for documenting or conserving the archaeological findings, and implementing them.

In this Presentation, we will discuss the current state of our project and demonstrate the possible entries for archaeological remains and their location in the topographical map in a geographic information system in different scales.

12 WHAT IS LEFT AFTER LARGE SCALE EXCAVATION PROJECTS? A ROMANIAN PERSPECTIVE

Author(s): BORS, Corina Ioana - Damian, Paul (National History Museum of Romania - MNIR)

Presentation Format: Oral

The National History Museum of Romania has an important expertise as concerns the preventive archaeology in Romania during the last 3 decades. It was involved in large scale projects of this kind, being a pioneering institution in this domain. The paper will present a series of key issues such as: the management and outcome of post-excavation analyzes, negotiating with the stakeholders in the benefit of archaeological heritage and opportunities and constrains for developing a professional career in archaeology. Also, will be provided a brief synthesis about the evolution of the national legal system for the protection of the archaeological heritage, and certain key aspects which require a correlation with the relevant European legislation. The perspective provided by the paper encompasses both positive evolutions, but also challenges which had to be overcome while undertaking large scale preventive excavation in Romania, in various historic provinces and for different historic periods. Last but not least, a major question has to be addressed: how can integrate a museum of national rank the scientific results and discoveries obtained by managing major preventive archaeological projects?

13 HUNGARIAN CASE STUDY – PREVENTIVE ARCHAEOLOGY IN THE LAST DECADE

Author(s): Wollak, Katalin

Presentation Format: Oral

There is semi-private structure in present-day Hungarian preventive archaeology. The main actors in the model are the institutions from the 19th century, museums operating in the county system, on the other hand the 21st century heritage management institution using modern technologies, operating on a constantly changing structure.

The Malta principles were included in the Hungarian regulations already in the second half of the 1990s and a legal environment was established that strongly supported archaeological interventions. This has resulted in the excavation of millions of square meters each year with investor funding, without offering any flexibility, resilience, and without evaluating the significance.

The consequence of this was a very strict legislation, introduced in 2011, defining the maximum length and cost of archaeological interventions. It was fearful that the restrictions could lead to damage to the archaeological heritage. The contribution is going to present those measures which may help in avoiding this danger.

14 HENDRICK HAMEL AND HIS NEIGHBOR: AN ARCHAEOLOGICAL APPROACH TO HERITAGE IN CONTEMPORARY KOREA

Author(s): Kim, Geon Young (Seoul National University)

Presentation Format: Oral

After Hendrick Hamel, a Dutch VOC sailor and his fellows left Joseon in 1666, it was not until the early 20th century that his story was reintroduced to Korea. Ever since then, more than a dozen editions of Hamel's journal were published, along with exhibitions and museums that are dedicated to this historical figure. The local government of Gangjin county has set up a series of material culture in memory of Hendrick Hamel. The material culture that is reproduced in modern Korean society, based on Korean's un-

derstanding, reveals the need in contemporary society towards this particular past. His sudden popularity in Korean society also reveals several intriguing questions. This article will test several contemporary archaeological methods along with ethnographic methods, firstly to see how this 17th-century foreigner was memorized and reproduced in the Korean context. Secondly to see why this historical person is so important to Korea. Thirdly to understand what Hamel and the related material culture means to the locals of Gangjin county and Korean society in general.

15 SARUQ AL HADID: A NEW APPROACH TO THE PAST WITH A FUTURE VISION

Author(s): Gutierrez, Lucia (Art & Conservation) - Al Ali, Y. - Hamadi, M. (Restoration House, Architectural Heritage and Antiquities Department, Dubai Municipality)

Presentation Format: Oral

The archaeological site of Saruq al Hadid (Dubai, UAE) is a unique example of the beginnings of a nation's history. It has provided a very important collection of archaeological objects that grows every day and that allows reconstructing the historical evolution of a territory from the 1st Millennium BC. In turn, it contributes with several questions to the scientific community for the reliable reconstruction of the activities that were developed in it and the events that led to its final. But, if this were not enough, Saruq al Hadid represents a paradigm of understanding and management of the UAE Heritage at the most emerging moment in the country. A moment of change and evolution towards a diffusion of its Heritage and its culture with a high investment in the creation of new museums and different formulas to exhibit its historical legacy. Through sites like the one presented here, Dubai wants to show its History and bring it closer to the rest of the world; a complete future project that will culminate in the year 2020 with the Universal Exhibition in the city.

16 ARCHAEOLOGY OF PLASZOW CONCENTRATION CAMP (KRAKÓW, POLAND): BETWEEN HERITAGE AND EDUCATION OF MEMORIAL SITE

Author(s): Karski, Kamil (The Historical Museum of Kraków; Institute of Archaeology, Rzeszów University)

Presentation Format: Oral

25 years after the premiere of Steven Spielberg's "Schindler's List", the debate of Second World War's heritage and memory in Kraków is still ongoing. Selected places of the local landscape become more popular among tourists, local residents. The number of commemoration were prepared by heritage management organizations (like city council, museums, NGOs). Nevertheless, the area of former Plaszow labor and concentration camp is almost invisible for the locals, whose treat it as a park, place of social and sports activities without the consciousness of its history.

Since 2016, the area of the Plaszow camp has been the object of comprehensive archaeological research, carried out by The Museum of of Krakow. The purpose of the field works were documentation and verification of information collected during previous historical research, regarding the localization of mass graves, a topography of the camp and preserved architectural relics. During the project various methods of non-invasive and invasive research were used, i. e. LIDAR analysis, geophysical (magnetometry method, electrical resistance surveys, GPR; 2016-2017), surface surveys (2017-2018) excavations (2017-2018).

The results of the research were used for the preparation of the scenario of the commemorating of Plaszow's victims' history as a memorial site and museum. The camp's archaeology become the aim of interest of local residents and were fitted in the education programme.

In my presentation, I would like to discuss cultural, social and scientific contextes of archaeological research in Plaszow camp, treated as the dissonant heritage of Kraków's history. Besides the results of archeological research, I will pay special attention to the social context of works (presentation, representations and expectations), as well as a social response to the process of commemoration and heritage management of local and city's society.

17 IN SEARCH OF NEW METHODS AND STANDARDS FOR FUNERARY TAPHONOMY IN COMMERCIAL ARCHAEOLOGY

Author(s): Durczak, Kinga (Independent)

Presentation Format: Oral

Funerary taphonomy has been a growing field in recent years. There are many areas of this discipline where research is carried out. In the last 25 years new methods have been developed and old has been refined. New progress brought new opportunities for this study fields, nevertheless we are still challenged with the same problem. Archaeological excavation is a destructive process and during which we only get one unique opportunity to make observation and documentation for future analysis and interpretation. Once the excavation does most of the information, when not required, will be gone.

Where there are guidelines how to excavate and take care human remains. There are still no wide available rules, how to prepare documentation that could be later used in the analysis and interpretation of human burials. Currently there is wide range digital methods existing that can be employed in this process (Photogrammetry, GIS, drones, 3D scanning). There is growing trend to use such methods and multiple case study show that they have great potential. However, there is still question what best practice should be. What can provide more information, be the most efficient and affordable technique to use in everyday archaeological research.

A. **ARCHAEOLOGICAL EXCAVATIONS ON THE MODERN CEMETERY AND PROBLEMS OF ITS ORGANIZATION**

Author(s): Belyaev, Leonid - Grigoryan, Svetlana (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Poster

Historical necropolis of the Moscow Novo-Devichi Convent of the Smolensk Icon of the Mother of God was organized in 18th – the early 20th century. The members of famous Russian noble families, military men, scientists, philosophers, poets, merchants and manufacturers were buried inside the convent walls in the stated period. According to the archive investigations, historical necropolis by the end of its existences has extended in all sides from the central group of churches to the tens of meters, and in its south-west part has almost reached the south wall. Archaeological works of 2018 were organized on the convent territory because of the general program of its reconstruction and alteration of utility services what ultimately resulted in the new era of the convent investigations. In the course of 2018th field works it was able to manage that almost under upper layer of grass the grave constrictions of different periods, massive in its size and served as identifiers of the late burials were preserved. In most cases this constructions covered or partly destroyed each other practically without living vacant space for the archaeologists to force their way deeper to the cemetery surface. The only way to do this was to break the preserved mason work. At the same time to demolish the grave constrictions even partly means on some parts of the necropolis to save the separate buildings of the convent in general. However it possible to do only trough the adaptation of measures of the foundations preservation in course of vertical planning and engineering works. The current draft took into account the requirements for the protection of architectural monuments and the needs of modern engineering, the exceptional memorial value of the UNESCO monument which the convent assemblage is and its liturgical functions, as well as the rules governing archaeological work.

384 **WRITING GRANTS FOR THE WENNER-GREN FOUNDATION**

Organisers: Rutherford, Danilyn (Wenner-Gren Foundation)

Format: Workshop

The Wenner-Gren Foundation is a key supporter of anthropology worldwide. Danilyn Rutherford, the Foundation's president, will offer a workshop designed to help anthropologists from different countries and traditions of scholarship navigate the process of getting a grant. She'll describe the various funding opportunities Wenner-Gren offers for international graduate students, faculty and institutions, say something about the review process, and offer helpful tips on how to write a winning proposal. She will also share news about some initiatives Wenner-Gren is undertaking as part of its new strategic plan. There will be plenty of time for questions.

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